

1948-1953.

File No. MIP 1151

B CLASS

Public Works

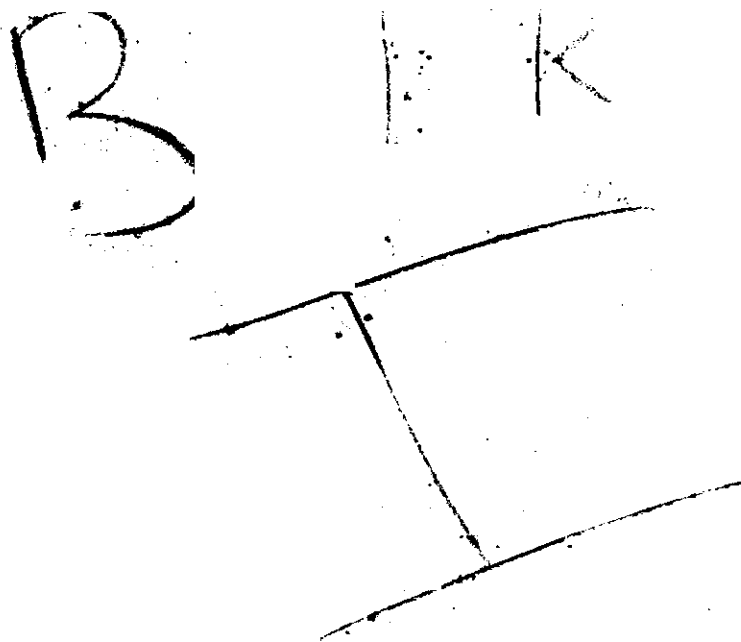
DEPARTMENT

J

BRANCH

Subject:—

Ghataprabha Valley
Development Project
A purely food crop
scheme.



File No.

MIP 1151-J. Part V

DOCKET SHEET

Subject:— ghate prabha
valley Development-
Project. A purely
flood crop scheme

File No. MIP.1187P. W DEPT.J BRANCH.

References:—

Date.	To whom sent.	Notes and instructions.

Report of the Cabinet Sub-Committee on the measures to improve the financial position of Major Irrigation works in the Province of Bom

B This was discussed at the meeting of H.M.S. held on the 1st September 1948 and the recommendations of the Cabinet Sub-Committee were ordered to be published for eliciting public opinion. The details of distribution of the water impounded at Ajla were discussed. It was decided that no perennial irrigation be allowed. The canal should be so projected as to give one season crop to as large an area as possible and all lands under command should take water.

Gd. L.M. PLATIL
1-9-48

For noting.
Id. M.D.D.G.
13-9-48

B is very important. It is a new departure of policy on irrigation schemes.

S.E., S.I.C. will have to be informed of this decision.

Id. N.P.G.
15/9/48.

I.B.(II).

Resubmitted together with serial No. 52007.

2. The Report of the Cabinet Sub Committee on the measures to improve the financial position of major irrigation works in the Bombay Province is to be discussed in the meeting of the Council of Ministers to be held on Tuesday the 28th Sept. 1948 at 11.30 A.M. at the Council Hall, Poona. The Secy (Irrign.) is requested to attend this meeting.

3. The Chief Secy. has confirmed that the decision recorded by the H.M. (Excise) in his minute dated the 1-2-48 was arrived at at an informal meeting of the Cabinet held on 1-2-48. The Report in question is to be brought up for consideration before the meeting of the cabinet to be held on 28-9-48. In view of this, no further action is necessary with ref. to the portion side lined 'A' of H.M., Excise's minute, dated the 1-2-48. Copies of the H.M. Excise's minute, H.M., P. D.'s orders thereon and Secy. (Irrign.)'s instructions in connection therewith have been taken for taking necessary action separately so far as portion side lined 'B' of the minute is concerned.

4. A copy of the Report in question and the papers underlying that Report are put up so that they may readily become available as and when it is discussed in the meeting.

Thro. I.B.(I).

2
PWR
27/9/48.

27/9/48

The Cabinet decided on 28-9-48 that the report should be published.

H.M. B.W.D. suggested that it should be published as early as possible.

Id. N.P.G.
28/9/48.

1.B.(II)

Resubmitted with the necessary draft
for appl. with ref. to the Secy. (Mgns)'s orders
dated the 15-9-48
Thrs. D.E.(1).

200
3/10/48
SMM
5/10

Though the Cabinet decided to put on
the report. It is now clear it agreed to a
decision at 'B' on p.1. HM. has PWD
has remarks: "for noting" below this. It is
perhaps the desirable to call for SE's report on
this point rather than issuing him the present
order. If a strength of 20000 is to be used in
sub season by 100 days, the head discharge will be
like about 2000 uses

Whe
5/10

Secy(I)

No decision of the cabinet was
taken on point B at the regular meeting.
He should call for a report from
the SE.

Whe
7/10/48

II)
resubmitted with a fresh draft for appl.
Thrs D.E.(1)

10/10/48
SMM
15-10-48

No. 8151/36-2 B. (II)

Letter

P.W.D.,

B.C., Oct. 194

To

The S.E., S.I.C.

NOT

Subject:- Daddi Dam Project.

It has been decided that the water that will be
impounded ^{in the proposed storage at-} at Ajra ~~site~~ should not be supplied ^{to a} for perenni
crops ~~irrigation~~ and that all the land owners whose lands come in
command of the canal should take water. You should,
therefore, project the canal in such a way as to give water
to as large an area ^{as possible for one} of seasonal crops ~~as possible~~.

DA.
Nil.

By order etc.

Copy forwarded to the Ex. Engrs, Irrign. Projects Div. (Cantt)

BSP.
5/10/48

✓
83

NO. 8151/36 - J.B.(II).

To

The S.E., S.I.C.

6 Letter

P.W.D.,

B.C.,

22nd Octr. 1948

22

Subject:- Daddi Dam Project.

has been suggested that instead of allowing big perennial water -
2. It is proposed to supply water to as large an area as
the proposed storage or time may be used in order to get as good
possible for one seasonal crop only and not for perennial
crops from the proposed storage - at Ajra and make it compulsory -
for all land owners whose lands ^{come} under the command of the
canal to take water from it. You are requested to offer your
remarks on this proposal as early as possible with try. date D.A.
which has the full details of the lands to be affected under the proposed
order etc. N.H.

Copy forwarded to the Ex. Engr., (Ingr. Projects Div. Clutta) for information

2087.
21/10/48

W.H. The

General Manager W.P. (B.P.)
1. 10. 10. 1948

Letter.

No. 8151/36-I.B.(II).

Public Works Department.
Bombay Castle, 22nd October 1948.

To

The Superintending Engineer, Special Investigation Circle.

Subject:- Daddi Dam Project.

.....

It has been suggested that instead of allowing any perennial irrigation, the proposed storage at Ajra might be used only for growing food crops in kharif and rabi seasons if necessary by making it compulsory for all land owners whose lands come under the command of the canal to take water from it. You are requested to offer your remarks on this proposal as early as possible with rough details as to how the project for the canals would be affected by such a proposal.

By order of the Governor of Bombay,

D.A.-Nil.

for Deputy Secretary to the Government of Bombay,
Public Works Department. *21*

Copy forwarded to the Executive Engineer, Irrigation Projects Division (South), for information.

3

KCJ/22-10-48.

Y.A.L.
23/6.

ISSUED

28/10/48

24/11

Letter.

No. 8151/36-I.B.(II).

Public Works Department.
Bombay Castle, 22nd October 1948.

To

The Superintending Engineer, Special Investigation Circle.

Subject:- Daddi Dam Project.

.....

It has been suggested that instead of allowing any perennial irrigation, the proposed storage at Ajra might be used only for growing food crops in kharif and rabi seasons if necessary by making it compulsory for all land owners whose lands come under the command of the canal to take water from it. You are requested to offer your remarks on this proposal as early as possible with rough details as to how the project for the canals would be affected by such a proposal.

By order of the Governor of Bombay,

D.A.-Nil.

for Deputy Secretary to the Government of Bombay,
Public Works Department.

Copy forwarded to the Executive Engineer, Irrigation Projects Division (South), for information.

3

KCJ/22-10-48.

Y.A.L.
23/10.

15 SEP

28/10/48

8151/36,

P.W.D

I.B.(II)

The S.E. K.G.C. expedient under
G.M. No. 8151/36-G.B.(II), dt. the -1-49.

G.B.
17/1/49.

Absolute safe storage

@ Storage with two shortages
in 25 years.

† For sections, please see printed sketches (accompanying).

Statement giving details of alternative projects and comparative out-turn of food, c

Acreage of crops and capital for construct

Pattern.	Proportions of crops.	AI/DC	Run off from catchment for which canals are designed.	1 Ajra. * 21000.
		Rabi & Kharif	Not-weather	
Cane:Kharif:Rabi				
" A "	1 : 5 : 5	5.5	3	Area irri.(lakh acres): 1.9 Sections of L.B.C. 1 p " Dhupdal R.B.C. - " ~~Dhupdal~~ Daddi R.B.C. - Costs Rs.(Crores): 5.4 Financial Return: 2.5 Cap./ton.: 333 only 1/2 of this grain) → Addl.food(lakh tons): 1.62

" B "	1 : 10 : 10	5.5	3	Area irri. (lakh acres) : 2.7 Sections of L.B.C. : 1 p Sections of Dhupdal R.B.C : - " of ~~Dhupdal~~ Daddi " : - Cost Rs. (Crores) : 6.6 Financial Return : 2.2 Cap./ton. : 350 (only 2/3 of this grain) → Addl.food (lakh tons) : 1.88

" C "	0 : 1 : 0 1/2 (for half) 0 : 0 : 1 (for rest)	5		Area irri. (lakh acres) : 4.6 Sections of L.B.C. : 1+2+3 Sections of Dhupdal R.B.C: 1 p Sections of Daddi R.B.C.: - Cost Rs. (Crores) : 18.0 Financial Return : 0.76 Cap./ton. : 785 Addl.food (lakh tons) : 2.29

" D "	0 : 1 : 1	5.5		Area irri. (lakh acres) : 6.0 Sections of L.B.C. : 1+2p Sections of Dhupdal R.B.C: - Sections of Daddi R.B.C.: - Cost Rs. (Crores) : 12.1 Financial Return : 1.5 Cap./ton. : 403 Addl.food (lakh tons) : 3.0

NOTE: (1) Where the actual capacity for which storage tank is required to be column, the figures for which storage will be constructed actual.

(2) Though Daddi is mentioned as the name of the storage, we may at Daddi and that too where an R.B.C. from Daddi is envisaged.

DEVELOPMENT PROJECT:ALTERNATIVES.

per cent concentration of crops.

ing their efficiency in terms of Financial Return,
Capital per ton of food &c.

on of scheme per ton of food produced etc

2 Ajra. @ 32000.	3 Daddi * 35000.	Ddi @ 520	5 Ajra: 21000 Daddi: 35000 *Total:56000	Recurring cost per ton of ad- ditional food produced.
(Ddi: 50,00)				Rs.
2.8	2.9	2	4.7	
1	1	1+p	1+2	
-	-	-	-	1.8
-	-	-	-	
8.0	12.5	14	22.1	
2.5	1.6	6	1.8	
330	505	10	540	
2.42	2.47	.61	4.09	
(Ddi: 50,00)				
4.1	4.2	5.0	6.3	
1 + 2p	1 + 2p	1+3p	1+2+3p	
-	-	-	-	
-	-	-	-	
9.6	14.0	2.3	25.9	4.6
2.2	1.6	.3	1.3	
339	480	88	595	
2.88	2.90	.13	4.35	
(Ddi.:5000)				
5.1	6.7	7.7	8.5	
1+2+3	1+2+3	2+3	1+2+3	
1+2+3 p	1+2+3 p	-	-	
-	-	2 p	1+2+3 p	4.0
20.5	25.5	1.5	~~31.5~~ 33.1	
0.76	0.78	.73	0.77	
795	775	325	780	
2.55	3.33	.83	4.26	
(Ddi. 4000) (Ddi: 25,000)				
7.4	7.9	9.8	10.6	
1+2+3p	1+2+3p	2+3	1+2+3	
-	-	1	1+2p	
-	-	-	-	4.0
16.8	23.0	7.8	29.3	
1.3	1.0	1.1	1.1	
456	585	565	550	
3.7	3.94	1.90	5.30	

constructed is less than the Run off fm catchment as shown in the topmost is shown in brackets.

ually have some other site of Dam say idalga. with only a pick-up-weir

No.Bm.Daddi.

Office of the Superintending Engineer,
Special Investigation Circle;
Dharwar: 4th December 1948.

To

The Secretary to Government,
Public Works Department,
Bombay.

Subject: Ghataprabha Valley Development Project:
A purely food-crops scheme.

P-7 Reference: Government Letter, Public Works Department No.8151/36-I.B.(II), dated the 22nd October 1948.

2. Government have called for remarks on the possibility of "Daddi Dam Project" (by which I suppose they want to convey "the Ghataprabha Valley Development Project") with a storage at Ajra, as a food crops scheme. While the possibilities are described at length in this letter, figures in the enclosed statement will by themselves allow a comparison between perennial canals (see columns A and B) and Food-crops canals (see columns C and D).

Before going into the merits and demerits of food-crops scheme, I take the opportunity of recording certain remarks to leave no mis-understanding about the success of such a scheme. Unless precautions as explained below were taken, a food crops scheme though drawn out as such, is bound to be a cash crop (e.g.sugar cane) scheme, as is evinced by experience on all and sundry canals in Maharashtra and Karnatak, ranging from the small Gaddikeri Tank and Gokak Canal in Karnatak to the large Nira Right Bank Canal in Maharashtra. Even in these days of food-shortage with high rates for grain and only fair rates for gul, the popular and influential crop in demand is cane and not food-grain*. The safest way to ensure growth of food-crops only is, therefore, to design the canal as a purely monsoon canal (without a large storage reservoir).

3. Looked at from the point of view of the needs of Bombay Province, it is certainly reasonable that Government should construct future Irrigation Schemes as food-crops schemes. Designed as such, they will need many modifications both in engineering designs and administration. There is in addition a third and far more important aspect viz., education and inducement (which will practically amounts to compulsion, if our past experience is to

(P.T.O.)

Foot~~H~~-Note:-

The Cultivator finds a better financial return, by cash crops and hence tries his utmost to use water to grow non-food-crops. That does not, however, mean that he cannot afford to ~~grow~~ grow grain crops. ~~W~~ Irrigated grain crops are certainly more attractive than rain-fed grain crops. But cane is still better.

The argument that it does not pay to grow food crops under canals is misleading. All it means is that it does not pay much as "Gul".

count) to ensure universal use of water by all ~~and~~
~~sundry~~, for growing* only foodcrops (and not cash
crops) on lands under the area under command of canals.

.. The only instrument in the possession of Government to stop cultivators from using canal water for non-food crops will be to impose very heavy Irrigation rates for such (non-food-grain)crops. Mere panchnamas are an impracticable proposition as the procedure is hopelessly complicated and dilatory. Experience on first class major canals in the Deccan Irrigation Circle has amply proved this. ..That simply sweats and exhausts the canal staff and has little effect on the cane-grower.

If, however, Government are, for any reasons, ~~not~~ not prepared to sanction exorbitant rates for non-food-crops on food grain canals, it is best that they give up all hopes to make the scheme a success and stop incurring expenditure on such schemes.

4. To ensure that canals constructed for food crops should be used as such only, the only course left would be --

(i) to declare that all land under command of canal is intended for food crops only and to make use of canal water for food crops compulsory (which in its turn requires that Government must guarantee supply of water to all land commanded);

(ii) to declare that all crops under the command of canals will be charged for irrigation, whether water is taken to crops or otherwise during the season or seasons, in which water is issued;

and (iii) to pitch the Irrigation rates for all non-food-grain crops so high as to -

(a) make it impossible for cultivators to grow them,

(b) increase the rates still further whenever the rates of non-food crops rise further still.

There is only one difficulty. Persons owning wells in the A.U.C. will complain, ~~that~~ they were till then growing certain crops on wells and that they invested capital on that understanding. To face such cases, Government should ~~not~~ find out average areas grown in the past three years on each such well and should allow to owners concessional rates for that much area of non-grain crops in future and on the clear understanding that if they ever exceeded the stipulated area of non-

*Foot-Note:- There is a universal misunderstanding about allowing a small proportion of cane along with food-crops. This will be removed if it is remembered that with a 1 to 2 proportion of cane to food-crops (as applied to lifts from canals) 90% of the water goes to cane and only 10% to grain. The proportion of tonnage of Gul and Grain is also the same i.e. 90 to 10.

non-food-crops, the concession will be lost for-ever.

- (iv) Even in concessional areas (described above) the rates for non-food-crops should not be less than cost of lifting water for the said crop on wells and should be charged whether the crop is irrigated on well-water or on canal water.

I have dealt with the above at some length as the whole structure of a food crops canal will crumble to dust if the age-old system of panchanamas and of low rates for non food crops (followed on Major Canals) is to continue.

5. It need hardly be added that an amount of propaganda will have to be done by the Agricultural Department to train cultivators in agronomical and cultural methods and what is more, Government will have also to help them in supply of manures. Again to ensure that these manures and the grain thus produced is not sold in black market, it will be desirable, if not essential, to declare that -

- (a) "Manure shall be supplied at normal rates in return for half the produce (to be estimated by Government) which must be sold to Government at rates to be fixed by Government".

and (b) "Even otherwise 25% of the outturn shall be sold to Government at scheduled rates".

Actually. I would suggest

- (c) that all agricultural produce in canal tract, grain or Gul should be freezed* (free trade outside being stopped), purchased and stored by Government for

(1) re-issue for local use to cultivators at certain rates;

and (2) export where required i.e. to deficit areas in the province through Government godowns.

and (d) that Government should supply all manure needed in canal tracts, all direct import of manures there being stopped.

Howsoever harsh this may appear, that is the only solution, if the scheme is to give results expected of it. Normal levy schemes are far more troublesome.

6. Having explained the social and economical difficulties and suggested methods to overcome the same, I will now deal with the Engineering side.

- (a) A ^{Purely} ~~monsoon~~ monsoon Canal.

Looked at from the point of view of food production only, a weir-cum-barrage or an ordinary weir (Orthodox type) design is bound to entail minimum cost of first construction; little or no storage is needed, as monsoon floods are large and practically continuous except in September; only a small storage may be desirable for this,

*Foot-Note:- The canal itself will serve as a trench, only road bridges being required to be guarded against exports. This can be seen to during the designing stage itself.

this but even that cannot be said to be essential. In the case of Ghataprabha Canals, as a weir exists already, a purely monsoon Ghataprabha Left Bank Canal ✓ is certainly a sound proposition. A Scheme for 1500 cusecs is already before Government. If should, for similar reasons, be possible to have a Right Bank Canal from Dhupdal and in fact to have a 4000 cusecs (or larger) canal on Left Bank so as to cater for the whole of the Ghataprabha Left Bank instead of for only the first half.

If growth of food crops were the aim of Government, all the Irrigation schemes contemplated by the Government of Bombay will have to be moulded on these lines, (all projects for storage reservoirs being shelved), ~~that~~ will actually result in reducing the financial burden on Government, a very important point in the present period, when anti-inflationary measures are being very seriously considered.

In the letter under reference, however, Government have asked for a report on "Daddi Dam Project" with a storage at Ajra and I, therefore, offer remarks on the economics and general results of such a scheme.

(b) An 8 months canal.

Where a reservoir is cheap (as in the case of Ghataprabha* Valley (i.e. cost of storage per m.c.ft. small), there is a definite advantage in having a storage tank in addition to the weir. The advantage lies in the capital on canal being utilized for eight-months instead of for four-months only as in the case of a purely monsoon canal. It will, at the same time, be noted that the capital on the reservoir is idle during the 8 months of the year and utilized for four months only. (In the case of a perennial canal, the capital expenditure on the reservoir is utilized for 8 months out of the 12.)

The weakest link in this pattern is this: The draw-off from reservoir during Rabi season depends upon the rainfall of a given year and records prove beyond doubt that there is great variation in this. A reservoir designed to cater for the full commanded area in a normal year will, therefore, leave surplus storage in good years and will be deficit in years of lean rainfall. The demand of water for food crops (even with compulsory irrigation for all area under command) will, therefore, offer conditions far more fluctuating than in the case of a perennial system (like Nira, Pravara, Godavari, etc.) where the demand of water for cane varies within fairly narrow limits, even with fluctuation in rainfall. It is important to note that even so, Government are criticised for surplus left in good years, a case being thereby made out for sanctioning larger areas of cane or larger percentage of overlap. Even supposing

we....

* Foot-Note: Unfortunately official publications are misleading. They show the storage at Daddi as the costliest amongst all schemes in Bombay. Actually the exact converse is true, especially in the case of Ajra and Hadalga.

we satisfy people with only two waterings to food crops in years of lean rainfall, the heavy surplus left in good years will be vulnerable to bitter criticism; Industrious cultivators and capitalists will then begin to demand use of the storage for cash crops beginning their demand for supply of water to cane in hot weather. The campaign will, as usual, begin with requests for favour of sanction for one year only in the first instance but will become a permanent item soon. The fears of capital borrowed by Government in the name of food crops, being diverted and used (under Government's very nose) on cash crops will thus turn out to be true, as time marches on. When I say this, I am only speaking from experience, and not theorizing. How far Government expects to face the situation, is difficult to say but past experience leads to pessimism. Leaving apart the perennial canals in Maharashtra, the history of the 4 months canals, like Gaddikeri and Dharma, ^{and} the 8 months Gokak Canal bears ample evidence.

(c) Storage needed for an 8 months canal to form the most economic scheme.

To make an 8 months food grain scheme most economic, the design will have to be on the following lines:-

- (i) The reservoir should be designed for a storage equal to the run-off of the worst years on record. However, 2 deficiencies in 25 years may be permissible in the case of food-crops canals - a latitude that causes serious anxiety in the case of a perennial scheme.
- (ii) The capacity of canal should be designed for peak load during kharif and rabi with a view to catering for the total area under command (full length) with all suitable area (or say 90%) under food-grain crops, *in a period of 25 days.*
- (iii) The reservoir should be designed to supply the full needs of Rabi crops over the whole area under command (or 90%), and also the possible shortage in river discharge in September.

7. It is essential to record views about two crops being raised on the same area, one in Kharif and one in Rabi. Looked at from experience in advanced countries, this is not only desirable but actually a great advantage and the same arguments are put forward by some at times here also.

Important Note:- Experience on existing canals and on lift irrigation schemes, however, shows that cultivators demand water for food-crop-irrigation in Rabi season only. They are averse to growing food crops on canal water, during the monsoon season except in the case of rice. Mixed crops like rice and jowar on the same canal present administrative difficulties. The proposition of a purely rice canal is considered elsewhere. Regarding light monsoon food crops, cultivators advance the argument that they cannot grow two crops in the same land and out of the two possible seasons, they prefer Rabi. How far, therefore, a 2 crop (per acre per year) system is likely to be successful, is a point for the Agricultural Department to tackle. For the same reasons, the possibility of Monsoon demand in an eight months canal will be a point for them to deal with. Such a difficulty is not envisaged in a purely monsoon canal, especially if irrigation is made compulsory, as cultivators have no other alternative. This is a point deserving very serious consideration in all

food...

food-crops-schemes. It is not a point for --
Engineers. It is purely agricultural.

I am, ~~therefore~~, very doubtful about the capacity of the majority of our cultivators to utilize the amenities of an 8 months food-crops canal and I fear that ultimately, we may ~~aspire~~ have to rest contented with only one food crop per acre per year, on any given piece of land, the land - being fallow for the remaining eight months. ✓

Even with this proposal, we have the three following possible alternatives before us, assuming compulsory irrigation as an accepted proposition.

- (1) Half the area of each cultivator being irrigated in Rabi and the remaining half in Kharif.

Note:- (This will result in waste and also stealth of water).

- or (2) Upper half of canal reserved for Rabi and lower half Kharif irrigation (or vice versa), there being 100 per cent (or say 90%) concentration in areas catered.

Note:- Only monsoon irrigation on tail sections has not found favour on existing canals, as even tail areas demand water for ~~monsoon~~ crops only. Rabi

- (3) Same as 2 but the allotment of Kharif or Rabi to upper and lower sections being changed every alternate year. Thus e.g.

	Upper section.	Lower section
1946-47	Monsoon	Rabi
1947-48	Rabi	Monsoon
1948-49	Monsoon	Rabi
1949-50	Rabi	Monsoon

and so on.

- or (4) Alternate distributaries being given - Rabi irrigation one year and the remaining distributaries having Kharif in that year and the order being reversed in the following year.

Note:- This system has not been tried anywhere on existing canal and one has only to speculate as to how far cultivators will welcome it.

In any case, the proposition is not as economic (on the use of water) as in having all area with two crops every year. The problem of choice is, therefore, not so much of "Engineering" as of "Sociology" i.e. "the capacity of the cultivator".

habits, likings and

8. The difficulty in presenting to Government a realistic picture of the results of a purely food-crops scheme, therefore, lies in making a choice between the various alternatives. There is practically no end to possible alternatives but it will entail unending labour to work out the details of each imaginable possible alternative.

To make it possible, therefore, to present a picture, an attempt was made to work out figures for a few alternatives which were considered most feasible and to compare them with a few alternatives for perennial canals schemes. In doing so, it was essential to base estimated cost of storage

reservoir, canal, distributaries and field channels etc. on broad lines (i.e. without anything like a detailed estimate). In this case, Government have, in their letter, mentioned ~~but~~ ~~probably~~ they did not intend precluding other possible storage to supplement Ajra. The Ajra storage will by itself cater for only half the Left Bank Canal i.e. the first 44 miles, if 2 crops per year per acre are aimed at, the right bank canal not coming in at all. The views of Government on dropping out of consideration ~~of~~ the Daddi Right Bank Canal are not known. To allow an idea of all possible storages in the Ghataprabha Valley (storage at Ajra only being included under 2 alternatives), figures were worked out for 5 types of schemes with storages varying from 21,000 to 56,000 M.cft. with 4 alternative patterns of irrigation - A, B, C and D as shown below.

	Sugarcane	Kharif	Rabi	
A	1	5	5	
B	1	10	10	
C	(0 (0	1 0	0 1	For one set of distributaries For the remaining distributaries.
D	0.	1	1	Two food ~~crops~~

Pattern "C" is for one crop per acre per year while pattern "D" (also A and B) is for 2 crops per acre per year.

No attempt has been made to work out a case for a purely monsoon canal, as Government have expressly mentioned a storage.

9. It should not be considered an unnecessary repetition if I again explain that --

(1) only a few of the possible alternatives are pictured,

and (2) that the figures are based on broad assumption about -

(a) costs per m.cft. of storage, per mile of canal and per acre of area commanded for other items also.

(b) carrying capacity, duties, losses in transit etc.

and (c) annual cost of maintenance, establishment and tools and plant.

The main idea underlying the figures was to allow a comparison between the four patterns of cropping (A, B, C and D) mentioned above.

10. The accompanying statement gives information under the following heads for each of the 20 alternatives (5 alternative storages and 4 patterns of cropping).

1. area irrigated
2. Sections of canals to be constructed and catered.
3. total cost of scheme.
4. financial return with existing water rates.
5. capital per ton of food-grain produced annually
6. tonnage of additional food produced annually by the scheme.

The statement should give the correct perspective picture needed by Government; the following three heads should receive

particular attention.

(3) Total capital required.

* (5) Capital per ton of food-grain produced - annually .

* (6) Tonnage of food grain produced annually.

I presume the return on capital is not so important. For, it can be increased by increasing rates for irrigation and for which there is ample scope due to rise in prices of food grain.

The basic figures on which this summary is worked out can be sent, if so desired but even those are founded on broad assumptions, as stated above.

11. Conclusions:- A study of these will show as under:-

A purely food crops scheme (Patterns C and D)

(1) The full development of Ghataprabha Valley waters and lands can supply anything upto 5 lakh tons of food grains annually. With Ajra storage alone, we may have anything upto 3 lakh tons.

(2) Capital required to be invested on the project per ton of food grain annually will vary from 400 to ~~500~~ 550 Rupees, if we presume two crops per acre per year and about Rs.800/- per ton with only one crop per acre per year.

A mixed crop canal, cane and food (Patterns A & B).

(1) Food grain production will vary from a little less to 1 lakh tons per year with Ajra only to about 2½ lakhs tons with maximum possible storage. The remaining produce will be sugar-Gul, a cash crop.

(2) The capital per ton of mixed food (Gul and grain) will vary from about 350 to 600 per ton per year. But if we look to this from the point of food-grain only (which is our aim) the capital will be much higher viz. about 600 to 1200 Rupees per ton.

Taking into consideration the needs of the country and capacity of our cultivators (based on past and present experience) our choice should fall on pattern C, being of the nature of 1 food crop (alternately Rabi and Kharif) per year per acre. The chance of mis-use of capital being utilised for non-food-crops, though voted in the name of food crops, being a minimum.

Outline sketches explaining the extent of the various alternative schemes accompany and will be self-explanatory.

12.

*Foot-Note: It is strongly recommended that in all irrigation schemes, these figures should be asked for as it is they and not the financial ~~result~~ that is more important in these days of food shortage.

12. I am also working out independently on purely theoretical grounds, similar figures for the following alternative patterns:-

- (1) All area under cane blocks (1:3)
- (2) Half area under cane block (1:3) and the other half under food crops (2 per year per acre).
- (3) Rice-Gram scheme. *Two Types*
- (4) All food crops scheme. *Same as*
2 crops per acre per year (Pattern D).
- (5) All food crops scheme.
1 crop only per acre ~~per~~ per year
(Pattern C). *(Same as)*

These will be submitted in a few more days. I may explain that findings recorded in this letter are comparable with these though worked on independent lines. I will write about this shortly but may take the opportunity of recording that the rice-gram scheme is most attractive, in view of the fact that India's (and also Bombay's) main shortage is Rice and will also give to the cultivators a cash crop which is also a food grain crop.

D.A.:-
1 Statement. *9 ank*
20 sketches. *(Kept on the cane board)*

(Kept on the cane board)
Since you had as kept in

7
Superintending Engineer,
Special Investigation Circle.

Copy for information to the :-

- 1) Executive Engineer, Irrigation Projects Division (South).
- 2) Executive Engineer, Ghataprabha Left Bank Canal Division, Dhupdal.

G.30.12.
compd. by *gn*.

Secy. S. 46
8/1/49

with 8151/36
5014

9(11)
10/1

encl

7/1

W. D.
8151/36
1628

J. B. II

2nd P.
10/1

7-1-47

I.B.(11)

Submitted with ref. to ^{P 7} G.L.No.8151/36-I.B.-
-(II), dated the 22-10-48.

2. The S.E.,K.I.C. has offered his remarks on the proposal to grow only food crops in Kharif and Rabi seasons on all future irrgn.schemes in general and on the proposed storage at Ajra (Ghataprabha - Valley Development project) in particular. If the future irrgn. schemes are to be designed as food crops schemes, which is necessary and reasonable in view of the needs of this Province, he considers that such schemes will require many modifications in respect of the following aspects :-

- (a) Engineering designs
- (b) Administration
- (c) Education and Inducement.

Aspects (a): In dealing with the engineering aspect, he has considered it under the following heads :

- (i) A purely monsoon canal
- (ii) An eight months' canal
- (iii) storage needed for an eight months' canal to form the most economic scheme

Item (i) : He considers that a weir-cum-barrage or an ordinary weir (orthodox type) would entail minimum of cost of first construction. A small storage may be desirable to give continuous supply even in the month of September when there will be no large floods but storage cannot be said to be essential. He, therefore, suggests that all the irrgn. schemes contemplated by Govt. should be moulded on these lines and all projects for storage reservoirs should be shelved provided only food crops are to be grown on future irrgn.schemes.

Item (ii) : Where the storage reservoir is cheap as in the case of Ghataprabha Valley, the S.E.

recommends

recommends that there should be a storage tank in addition to the weir. A reservoir designed to ~~cover~~ for the full commanded area in a normal year will have a surplus storage in good years and will show a deficit in years of ~~lean~~ rainfall. Even with compulsory irrgn. for all area under command, the demand for water to food crops will offer conditions far more ^{fluctuating} ~~fluctuating~~ than in the case of perennial system where demand for water to cane ^{varies} ~~varies~~ within fairly narrow limits even with fluctuation in rainfall. When there will be surplus ^{water} left in good year, there will be demand for supply of water to cash crops like cane in not weatner. Gradually this demand will become a permanent. He, therefore, expressed the fear of capital borrowed by Govt. in the name of food crops being diverted and used on cash crops.

Item (iii) : He has suggested ~~three~~ different alternatives for designing the scheme in order to make an eight months' food grain scheme most economic. He doubts the capacity of the majority of irrigators to utilise the amenities of an eight months' food crops canal and expresses the fear that ultimately Govt. may have to rest content with only one food crop per acre per year on any given piece of land, the land being fallow for the remaining 8 months. As it is not economic to have one crop per acre per year, he suggests that the Agricultural Deptt. should consider how far two crops per acre per year system is likely to be successful.

Aspect (b) : He considers that mere panchanamas are an impracticable proposition to stop cultivators from using canal water for non-food crops as the procedure laid down for making panchanamas is hopelessly complicated and dilatory. To ensure that canals constructed for food crops are used for that purpose only, he suggests Govt. to adopt the following measures.

..... (i) to declare that all land under command of canal

canal is intended for food crops only and to make use of water for food crops compulsory;

(ii) to declare that all crops under command of canals will be charged for irrqn. whether water is taken or not.

(iii) to increase the irrqn. rates for all non-food crops so high as to make it impossible for cultivators to grow them and to increase the rates ~~still further~~ ^{whenever the} rates for non-food crops rise further still.

(iv) to grant concession to persons who have been growing non-food crops on well in the area under command of canals for that much area in ~~future~~ future on the express understanding that the concession will be lost forever if they ever exceeded the stipulated area of non-food crops. Even in concessional areas, the rates for non-food crops should not be less than ^{the} cost of lifting water for the said crop on wells and should be charged whether the crop is irrigated on well-water or on canal water.

Aspect (c): He suggests that the cultivators should be given training in agronomical and cultural methods and should be supplied with manures on the following conditions :-

(i) Half the produce of food grains to be estimated by Govt. must be sold to Govt. at rates to be fixed by Govt.

(ii) Even if manure is not supplied, 25% of the out turn should be sold to Govt. at scheduled rates.

He suggests that Govt. should be the sole distributor of manure in the canal tracts; all direct import of manures should be stopped. In order that the produce does not go in black market, he further suggests that all agricultural produce in canal tracts ^{grain or} gul - should be freezed, purchased and stored by Govt. so that it can be re-issued for local use at certain rates

rates and exported to deficit areas in the province through Govt. godowns.

This whole aspect falls under the perview of the Agriculture and Civil Supplies Deptts. The papers may be shown to those Deptts. to consider these suggestions.

3. While ^{dealing with} the proposal to have only food crops in Kharif and Rabi seasons on the proposed storage reservoir at Ajra, the S.E., presumes that Govt. does not intend to preclude other possible storages to supplement Ajra as the storage at Ajra will by itself cater only for half the Left Bank Canal i.e. the first 44 miles if two crops per acre per year are aimed at, the Right Bank Canal not coming in at all. In order to give an idea of all possible storages in the Ghataprabha Valley, he has worked out figures for five types of schemes with storages varying from 21,000 to 56,000 M. Cft. with four alternative patterns of irrign.; please see the statement at p. 9 ante. He comes to the conclusion that if the scheme is to be purely a food crops scheme the full development of Ghataprabha valley waters and lands would yield anything upto 5 lakh tons of food grains annually; Ajra storage alone would be able to produce anything upto 3 lakh tons. Capital reqd. to be invested on the project per ton of food grains annually would vary from Rs.400 to 500 if there would be two crops per acre per year, and about Rs.800/- per ton if there would be only one crop per acre per year. If the scheme is to be a mixed crop canal- cane and food- the production of food grains will vary from little less to 1 lakh per tone per year with Ajra only to about 2½ lakh tons with maximum possible storage. The capital reqd. to be invested on the project per ton of mixed crop (grain and gul) would vary from about Rs.300 to 600 per ton per year. If considered from the point of food grains only, the capital cost will vary from Rs.600 to 800 per tons per year.

4. Considering the problem from ~~the~~ all the aspects and after

after studying by comparison the different alternatives, the S.E., considers pattern 'C', viz one food crop, either in Rabi or Kharif, per acre per year - , to be the best one.

5. The information promised by the S.E., in para 12 of the letter may, perhaps, be awaited before taking any final decision on the proposal to allow ~~only~~ food crops in the proposed storage at Ajra.

Thro: D.E.(I)

UMP.
5/1/49

25/1/49

DS.
Secy. (Orig.)

C. In G.L. No. 8151-36-I B (II) on page 7 ante, ^{it is apparent that} The SE K.I.C. was asked to offer his remarks on the proposal of utilising the contemplated storage at Ajra for growing food crops in the Kharif or Rabi seasons and how this proposal would fit in with the projected G.L.B. canal - What was required, presumably, was to know whether the G.L.B. Canal as designed, - discharge, length etc. - would ~~be~~ be suitable or any modifications would be required if it has to be worked as a 8 months' canal ~~to~~ with Ajra storage. This point at issue ~~has~~ appears to have been lost sight of by the S.E. in putting up several alternative proposals for alternative storages, which are not germane to the case under consideration. Details ~~of a rough~~ have been roughly worked in this office, on page 27 Post & it will be seen that the present G.L.B. canal would be suitable for working as a Kharif or Rabi canal with a storage of 24000 Maf at Ajra. If appd, the details could be forwarded to the SE for remarks, verification & modification. It does not appear necessary for the SE to ~~work~~ work out on theoretical grounds for various other patterns mentioned in ^{his} para 12. The figures given, areas to be irrigated etc given by the SE cannot be verified. The tonnage of food production indicated by the SE appears to be abnormal.

P.T.O

As at A in the D.E(I)'s note.

✓
D.S.

Kf 12/2/49

Foot have since decided to have only
seasonal canals so the question of sugarcane
etc does not enter into the picture at all. We
should take advantage of the storage for utilising
the same in the two seasons. A stage will
be reached in the development of India, when foot
may be forced to revive cash crops, as in
my opinion, agriculture would not be economically
possible on seasonal crops, when the prices tend
to fall

100
21.2.49.

Sand. C. Lin. Dy
Engineer, KSE

Mr. P.
M/2

Ajra Storage & Ghataprabha L.B. Canal

The G.L.B Canal ^{per Project} as administratively approved has a length of 44 miles, a head discharge of 1500 cusecs & commands an area of 2,54,000 Acre in the portion now proposed to be constructed.

Assuming a concentration of 60 %, to the H.P. area that can be irrigated is, say 1,50,000 Acres in both Kharif & Rabi Seasons. ~~with a proportion of suitable~~ Areas suitable for different kinds of crops could be roughly as under:-

- i) Kharif Seasonals - 60,000 Acres watered once in 25 days.
- ii) Rabi " - 60,000 " - do -
- iii) Two Seasonal crops
rice, ground nuts &
small area of vegetables } 30,000 " watered twice in 25 days.

2) The areas to be irrigated in each Season, reduced to Seasonal basis will be as under

i) Kharif.	Seasonals.	60,000
—	Two Seasonals	60,000
	Time	1,20,000
ii Rabi	Same as above	1,20,000 Acre

3) The discharge required in each of the two Seasons with an $\frac{A}{D.C.}$ of 3.25 at head of Canal would work out to $\frac{1,20,000}{25 \times 3.25} = 1477$ cusecs. - The present designed discharging capacity of 1500 cs.

4) It is stated that the discharge at Dhurpadal is considerably more than 1500 cs for 3 months of the monsoon & falls short in October - Assuming that the storage would be required for about 15 days in the monsoon & 4 months of the Rabi Season, the total quantity of storage required at the head of the Canal wd. be

$$1500 \times 4.5 \times 30 \times 86400 = 17,496 \text{ M. cft.}$$

Adding for losses in transit in run & evaporation losses in the lake at 33 1/3 %

5,832

Total storage reqd at Ajra 23,328 M. cft.

The minimum run-off at Ajra is 21,000 M cft
& normal run-off. 32,000 ..

as against 23,328 M cft. The storage at Ajra
could therefore be designed for 24,000 M cft (or 32,000 M cft.
~~for~~ which is power generation)

5) Thus a Storage Reservoir of 24,000 M cft at Ajra

and the G.L.B. canal as at present designed for

will irrigate i) 60,000 Acres of Kharif Season

ii) 30,000 .. of Two Seasons

iii) 60,000 .. of Rabi Season

The cost of the Scheme will be Lakhs

i) Ajra Reservoir, 24,000 M cft.
Rs 2500/- per M cft = 6,00

ii) G.L.B. canal — = 540
Total Rs 11,40 Lakhs

Extra
The food production will be of the order
of 70,000 Tons.

Plg
4/2/49

Letter.

No.Bm.Daddi
Office of the Superintending Engineer,
Karnatak Irrigation Circle,
Dharwar, 25th January 1949.

To

The Secretary to Government,
Public Works Department, Bombay.

Subject:- Purely food-crops canals (Two seasonal)

Reference : Government letter No.8151/36-I.B.(II),
dated the 22nd October 1948 and continuation of this office
No.Bm/Daddi dated the 4th ^{P.7}January 1949.

^{P.11}
2. The statements and general discussion in the letter under reference will (I hope) give to Government a general idea about the success, possibilities of production and financial aspect regarding large scale (First class major) Irrigation Schemes, as purely food crops schemes.

In that letter I have explained at full length the real difficulties envisaged in the successful utilization of a two seasonal food crops scheme, viz:-

(1) The criticism likely to be levelled at surplus balances left unused in lake, in years of good rainfall in the A.U.C. and the pressure sure to be brought on Government to allow it to be used for cash crops like cane, ultimately practically converting the food crops scheme into a cash crop project.

3. I may be permitted the liberty of keeping a warning on record, that if Government are likely to yield on this point, they should think twice before launching on such a scheme and incurring heavy capital expenditure in the name of "Grow more Food".

I have, in that letter also pointed out that the only way to stop misuse of capital and demand by industrialists - (large and small) for growing cash crops, is to :-

(1) Make growth of food crops compulsory,
and (2) Pitch the water rates for non-food cash crops (at least under such food crops canals) so high as to :-

(a) Make them exorbitant and in no case less than what it costs to lift water from a well for a similar crop (quality and outturn).

The latter will at least leave Government in the happy position of getting a good revenue and a sumptuous return (more than 8%) on the capital thus misused, so that the profit can be at least used to make up for the high rates of importing grain (if it is available) or used for other means of growing more food.

Actually it is the low rates for non-food crops and the unwieldy crude and out-of-date procedure of depending upon Panchanamas for misuse of water, that is the root cause and if anybody is responsible for this defect, it is our own delay in taking action in accordance with "a" above.

P.T.O.

4. The proverb "Prevention is better than cure" holds good in this case as in other worldly affairs and hence I consider that the easiest method of -

(a) achieving the success of food crops canals,

and (b) leaving minimum chances of misuse of water

is to -

(A) design food-crops Irrigation Schemes as 4-months, Monsoon over-flow schemes (on the lines of -- Ghataprabha Left Bank Monsoon Scheme) which may be termed as "Inundation Scheme",

and (B) Utilise the post monsoon flow for a concentrated food crop scheme and the post-Rabi flow for a concentrated cash crop scheme both as near to head works (pick-up-weir) as possible and charge heavy rates for the latter, but under no circumstances should cash crops be intermingled with food crops (whether on wells or on canal water).

5. The arguments likely to be raised against such a proposal will be -

(a) that food crop irrigation alone is not an attractive proposition to the cultivator,

(b) that such a scheme does not allow proper rotation of crops and will, therefore, impoverish the soil,

and (c) that cultivators in dry zones do not find growth of monsoon food crops either successful or economical.

There is no doubt that there is some truth in these arguments but all these arguments are to a large extent superficial and put forward with some hidden motive by shrewd and influential cultivators for getting sanction to cash crops. This is particularly true of (a) above.

If a short and convincing proposition is required to rebut argument "c" above, I would suggest the "maize crop". It is grown on extensive scale in any of the three seasons and is useful both as grain or as green fodder. Regarding (b), gram or udid can be taken as a rotation crop.

6. However, I consider that there is a better proposal and which is likely to meet with the approval of cultivators also and this proposal is -

"A Rice-Gram Canal".

This proposal will be ideal, for -

(1) Rice is both a food-crop and also a cash crop.

(2) If kept unhusked, it has very good keeping qualities.

(3) The real food-shortage of India and even of Bombay is rice.

(4) The war-time experiment on Nira Canals of growing paddy has proved its success on soils in dry tracts.

(5) The post-Monsoon flow, supplemented by a little storage, will allow a good rotation crop viz. gram - a legumin and which is also in demand to make up a balanced diet.

7. The main difficulty experienced on Nira Canals in -- sanctioning this crops was -

(A) the heavy post-Monsoon waterings it demanded taxing both storage and carrying capacity.

(B) ...

and (B) inter-mixture with a large percentage of light crops which resulted in difficulty of distribution of water and consequent waste.

Regarding the former, there is one particular -- feature of Karnatak which helps to solve the difficulty. We get showers in April and May which bring down small floods and the waters of which are sufficient for planting rice for -- seedlings. Besides it is also possible to leave in the -- storage tank, at the end of previous Rabi Season, a quantity of water which will leave, even after allowing for evaporation in lake during Hot weather, sufficient quantity for the growth of seedlings in the month of April - May and which can be - transplanted in June - July i.e. soon after large floods arrive. With this arrangement no water should be needed after 15th - October. Sufficient storage for a few waterings in September, when floods subside, will of course be provided for.

8. Two types of Rice-gram Schemes should, therefore, be possible. One with the rice crop being sown after the arrival of first floods and taking water till harvest in November and then followed by gram immediately after harvest. The second with the rice crop planted for seedlings in May and actually transplanted in late June or early July (immediately after - floods) and harvested in October so as to require no water in Rabi Season. This will give sufficient period for sowing - gram.

Even so, there is likely to be some demand or -- complaint from some who will say that they do not want to - grow rice. Actually this should not be heeded but if some consideration was to be given, it should be done by allowing them "Maize instead" in Monsoon season only.

There is an amount of propriety in this proposal.
For -

- (a) Maize is a food crop and a high quality fodder crop
- (b) It can be grown very successfully in Monsoon
- (c) The outturn per acre is good

but the main point I value in it is :-

- (d) It needs water at the same intervals as for rice.
- (e) It is a short-term crop and no question of post-monsoon waterings will arise.

No other crop fulfills these requirements whether it is "jawar", "tur", or anything else.

This therefore meets with the difficulty "B" mentioned in the beginning of paragraph No.7.

9. With a view to allowing a comparison between other patterns and such a Scheme ("Rice-Gram"), I have worked out details of schemes as under. The main features are tabulated in the accompanying statement. This will allow comparison between the various patterns, all for compulsory irrigation in the area under command.

Symbol	Type	General description	Reference to S.No. in the accompanying statement.	Import-ant features
A	CANE-GRAIN	Mixed crops scheme more or less comparable to perennial canals in Maharashtra; figures are worked out with 2 different proportions of cane to grain.	1 2	All cane blocks 1:3 { Half cane blocks. Half food blocks.
B	RICE-GRAM	As described in paras 6 to 8 above; maize allowed as a substitute for rice. For difference between 3 and 3A see paras 6 to 8 above.	3 3A	Late sown rice. Early sown transplanted rice.
C	JWAR-BAJREE	Two schemes are worked out. One with 2 crops in the same land per year. Second with only one crop per year.	4 5	All food-grain. All food-grain.

Our main object is growth of food grain. Schemes - producing Gul and Sugar should, therefore, not be in the ~~present~~ picture at all. Even otherwise we should not be guided by financial return only. For, it can be increased by increasing rates for irrigation and for which there is ample scope. That view need not therefore weigh in our choice.

10. The real criterion should be capital per ton of food-grain of which we are so badly in need. Looked at from that point of view, Schemes Nos.1 and 2 need no consideration. - Regarding Scheme 4, two food-crops in the same land, one in Kharif and one in Rabi, it provides for a pattern which will be difficult if not impossible to be achieved in this country with the type of cultivator we have, though such a scheme is quite feasible with industrious educated cultivators with capital and resources as in America or Australia. The figures for that pattern are, therefore, more or less theoretical so far as our Province and its cultivator is concerned. This leaves only 3 practical patterns.

Capital per ton of food-grain.

3 - Rice (November harvest) and gram.	Rs.711/-
3A- Rice (October harvest) and gram.	Rs.628/-
5 - All food crops (light) 1 per year.	Rs.707/-

11. The transplantation rice Scheme in 3A is the most - attractive. Not only does the scheme need the minimum capital per ton of food but the food in this Scheme viz. rice is the one in demand. Even if the capital required for this were the same as for 5 or for the matter of that higher (as in pattern No.3), I would recommend that and not Scheme No.5. Figures of imports for recent years are not available but prior to war, Bombay imported mainly rice and gram. Little "jwar" was - imported.

Even ...

Even if ~~th~~ any difficulties were envisaged in the transplantation Rice scheme and even if scheme 3 was necessary to be adopted, I would adopt that in preference to the Bajree "jwar" Scheme.

12. Details for the Scheme will be sent if so desired. As stated already figures of cost per M.cft., duties, produce etc., are based on previous experience. Actual detailed estimates have not been prepared nor are they possible to be prepared.

The only difference between the base of figures in the accompanying statement and those in the statement accompanying this office No.Bm/Daddi dated the 4th ~~January~~ 1949 is this. In the former, costs of storage are assumed as so much per M.cft. of storage or ~~xxx~~ so much per mile of canal, while in the latter, figures of cost for a storage at Daddi or Ajra were based on actual cross sections and results of foundation bores, and on estimates as prepared in 1925 and recast for rates 100% over pre-war rates in the case of canals. Even so I do not think that estimates based on these latter are more dependable than those on the former.

Both figures are therefore comparable and should allow a general idea to be formed for choice of pattern.

D.A.1 statement.

7
8 Superintending Engineer,
Karnatak Irrigation Circle.

RGY/23.1
Compd.by:SR

9 (11) 28/1

25252 (2/2/1)

8151/36

6200

2nd f.
28/1

9 B

Statement showing important features of different patterns of irrigation schemes.

S.No.	Pattern	Produce in tons per year.			Total grain only	Capital crore Rs.	Financial return	@Capital per ton of food grain:
		Total	Gul	Rice				
1	2	3	4	5	6	7	8	10
1.	All cane blocks. 1:3	1,31,400	1,21,500	-	9,900	9,900	2.1	8,600
2.	Half Cane blocks) Half food crops)	1,40,813	87,750	8,666	40,517	52,433	8.3	1,594
3.	Rice (Kharif Rabi) grain	54,000	-	36,000	18,000	54,000	3.8	711
3-A	Rice (Transplanted) & gram	54,000	-	36,000	18,000	54,000	3.4	628
4.	All food crops 2 per year.	1,32,000	-	-	1,32,000	1,32,000	5.8	436
5.	All food crops 1 per year	1,22,000	-	-	1,22,000	1,22,000	8.6	701

*with present rates of irrigation.

@capital on construction of irrigation scheme.

† The produce could be doubled by doubling the capital. The smaller produce shall not be considered as inherent in the pattern.



Superintending Engineer,
Karnatak Irrigation Circle.

P.W.D.I.B. (II)

Resubmitted together with Serial no. 6200. ^{p. 34}

2. The S.E., K.I.C. has since ^{pp 29-35} furnished the information promised in para. 12 ^{p. 19} of his letter dated the 4-12-48. In view of the orders passed at pp. 25-26 ante., it is not necessary to consider the suggestions made by the S.E. in his ^{p. 29} letter dated the 25-1-49. A copy of the D.E. (I)'s note at at pp 27-28 ante. may be sent to the S.E. for remarks, verification and modification as per draft ^{p. 39 post} put up for appl.

Thro. D.E. (I).

28/2/49 ^{28/2/49} _{23/7/49}

Kf 412/49

✓
D.S.

vo. 8151/36-L.B. (II).

Letter

54

P.W.D.,

B.C., 1st ~~Feb~~ 1949.
March

To

The S.E., K.I.C.

Subject:- Ghataprabha Valley Development Project.
A purely food-crops scheme.

Ref:- Correspondence ending with your letter p 29 ante

No. Bm. Daddi, dated 25-1-49.

2. You were asked in Gh. no. 8151/36-L.B. (II), dated 23-10-48 to offer your remarks on the proposal to utilise the contemplated storage at Ajra for growing food-crops in the Kharif and Rabi seasons and how this ^{proposal} would fit in with the Ghataprabha Left Bank ^{as proposed in construction} Canal. The object behind this was to know whether the Gh. L.B.C. as designed - discharge, length, etc. - would be suitable or any modifications would be reqd. if it has to be worked as an eight months canal with Ajra storage. You have lost sight of the point at issue while putting up

Ajra Storage and Ghataprabha Left Bank Canal.

The Ghataprabha Left Bank Canal as per Project administratively approved has a length of 44 miles, a head discharge of 1500 cuses and commands an area of 2,54,000 Acres in the portion now proposed to be constructed. Assuming a concentration of 60%, the total area that can be irrigated is, say 1,50,000 Acres in both Kharif and Rabi seasons. Areas suitable for different kinds of crops could be roughly as under:-

- 1) Kharif Seasonals - 60,000 Acres. Watered once in 25 days.
- ii) Rabi Seasonals - 60,000 Acres. Watered once in 25 days.
- iii) Two Seasonal crops rice, ground nuts and small area of Vegetables. - 30,000 Acres. Watered twice in 25 days.

2. The areas to be irrigated in each Season, reduced to Seasonal basis will be as under:-

1) Kharif	Seasonals	60,000
	Two Seasonals	30000 x 2
	Total	... <u>1,20,000</u>
ii) Rabi	Same as above.	<u>1,20,000 Acres.</u>

3. The discharge required in each of the two Seasons with an Al of 3.25 at head of Canal would work out to $\frac{1,20,000}{25 \times 3.25} = 1,477$ cuses against the present designed discharging capacity of 1,500 cuses.

4. It is stated that the discharge at Dhupdal is considerably more than 1,500 cuses for 3 months of the monsoon and falls short in October. Assuming that the storage would be required for about 15 days in the monsoon and 4 months of the Rabi Season, the total quantity of storage required at the head of the Canal would be $1500 \times 4.5 \times 30 \times 86400 = 17,496$ M. cft.

Adding for losses in transit in river and evaporation losses in the Lake at 33%	...	<u>5,832</u>
Total Storage required at Ajra	...	<u>23,328</u>

The minimum run off at Ajra is 21,000 M cft. and normal run off is 32,000 M cft as against 23,328 M cft.

The ~~max~~ storage at Ajra could therefore be designed for 24,000 M cft (or 32,000 including power generation).

5. Thus a Storage Reservoir of 24,000 M cft at Ajra and the Ghataprabha Left Bank Canal as at present designed would irrigate -

- 1) 60,000 Acre of Kharif Seasonals
- ii) 30,000 Acres of Two seasonals
- and iii) 60,000 Acres of Rabi Seasonals.

The cost of the ~~work~~ scheme would be Lakhs.

i) Ajra Reservoir, 24,000 M cft at 2.500 per M cft=600

ii) Ghataprabha Left Bank Canal -540

Total Rs. 1,140

The Extra food production would be of the order of 70,000 Tons. ✓

2
BAK
1/3/49.
Omik
10/3

No.8151/36-I.B.(II).

Letter.

Public Works Department,
Bombay Castle, 1st March 1949.
bth

To

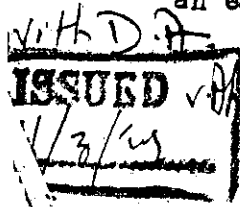
The Superintending Engineer, Karnatak Irrigation Circle.

Subject:- Ghataprabha Valley Development Project.
A purely food-crops scheme.

...

Reference: Correspondence ending with your letter No. Bm.Daddi, dated the 25th January, 1949.

2. You were asked in Government letter No. 8151/36-I.B.(II), dated the 23rd October 1948 to offer your remarks on the proposal to utilise the contemplated storage at Ajra for growing food-crops in the Kharif and Rabi seasons and how this proposal would fit in with the Ghataprabha Left Bank Canal, as proposed to be constructed. The object behind this was to know whether the Ghataprabha Left Bank Canal as designed - discharge, length, etc. - would be suitable or any modifications would be required if it has to be worked as an eight month's canal with Ajra Storage. You have lost sight of the point at issue while putting up several alternative proposals for alternative Storages. A note containing the details of Ajra Storage and Ghataprabha Left Bank Canal as worked out in the Secretariat is, therefore, sent herewith. You are requested to verify and modify the details and to offer your remarks thereon at an early date.



By order of the Governor of Bombay,

[Signature]
10/3/49. t/.

For Deputy Secretary to the Government
of Bombay, Public Works Department.

D.A.- A note
refd. to.

-1223

Letter.

No.8151/36-I.B.(II).

Public Works Department,
Bombay Castle, 1st March 1949.

To

The Superintending Engineer, Karnataka Irrigation Circle.

Subject:- Chhatrapraba Valley Development Project.
A purely food-crops scheme.

Reference: Correspondence ending with your letter No. Bm.Daddi,
dated the 25th January 1949.

2. You were asked in Government letter No. 8151/36-I.B.(II), dated the 23rd October 1948 to offer your remarks on the proposal to utilise the contemplated storage at Ajra for growing food-crops in the Kharif and Rabi season and how this proposal would fit in with the Chhatrapraba Left Bank Canal, as proposed to be constructed. The object behind this was to know whether the Chhatrapraba Left Bank Canal as designed - discharge, length, etc. - would be suitable or any modifications would be required if it has to be worked as an eight month's canal with Ajra Storage. You have lost sight of the point at issue while putting up several alternative proposals for alternative Storages. A note containing the details of Ajra Storage and Chhatrapraba Left Bank Canal as worked out in the Secretariat is, therefore, sent herewith. You are requested to verify and modify the details and to offer your remarks thereon at an early date.

By order of the Governor of Bombay,

[Signature]
10/3/49

For Deputy Secretary to the Government
of Bombay, Public Works Department.

D.A.- A note
refd. to.

2
BAK
1/3 10/3



2/2/49

No. Bm/Daddi

Office of the Superintending Engineer,
Karnatak Irrigation Circle,
Dharwar, 3/5 March 1949.

To

The Secretary to Government,
Public Works Department, Bombay.

Subject: Ghataprabha Valley Development Project.
A purely food-crops scheme.

Reference: Government Letter, P.W.D.No.8151/36-I.B.
(II), dated the 1st/10th March 1949. *p.43 ans*

2. I was surprised (and it pained me) to find that Government considered "I have lost sight" of "the point at issue". *p.7 ans*

3. Actually as Government in their letter No.8151/36-I.B.(II), dated the 22nd October 1948 did not give any idea as to the proposed storage (i.e. whether safe or with two deficiencies permissible in 25 years) and further as they referred to Ajra Storage in the body of the letter but mentioned the subject as "Daddi Dam Project", I had to work out five alternatives as under:-

Reservoir site	Storage (M.C.ft.)	
	Safe (minimum runoff on record)	Two deficiencies in 25 permitted.
Ajra	21,000	32,000
Daddi	35,000	52,000
Ajra Daddi	21,000 } 35,000 }	Not worked out

4. I further worked out (along with other relevant information) figures for food produced on two assumptions as under, as in their letter Government gave no indication as to the pattern of food-crops-irrigation.

Pattern A - Half A.U.C. under Kharif and the remaining half under Rabi.

Pattern B - Every acre under command with 2 crops per year - Kharif followed by Rabi.

From the present letter, it appears Government want tonnage of food grain: Those figures too are given in the statement accompanying this office letter of the 4th January 1949, for all alternatives. A reference will show the figures are 2.29 lakh tons and 3 lakh tons respectively for the two patterns A and B for Ajra with a storage of 21,000 M.cft.

To allow comparison regarding total produce in the purely food-crops canal as now envisaged with the orthodox and hitherto-fore-popular pattern of "cane-grain" canals (as in Deccan Irrigation Circle), I also gave figures of produce with this latter type.

5. Having taken every precaution to give to Government all possible figures with different alternatives, to allow them to choose the pattern of food-crops (and if possible the storage (21,000 or 32,000), I gave figures for and strongly recommended a third very practicable pattern in my letter, of the 25th January 1949, viz - *29 Ant*

Pattern C - Rice in Kharif with a follow-on crop of gram in Rabi.

6. To allow me to give full details of length of canal and its discharge at head and at various points along its length, it is essential that Government make a choice out of the various patterns or suggest a new one. I do not find any communication from Government to that effect. On the other hand, if Government wanted full details to be worked out for all the patterns - A, B and C and all the five alternative storages - that too has not been communicated.

Actually I sent sketches as accompaniments to my letter of the 4th January 1949, showing areas under command required for each of the 20 alternatives and that therefore gives the length of canal and the area under command. *x kept below for reference*

7. Coming to the "typical" calculations in the note worked out in the Secretariat and sent along with the Government letter under reference, I find myself in a peculiar situation as many well-established and accepted (in previous personal discussions) principles appear to be not acceptable to Government.

	Basis of my calculations.	Proposal as envisaged in calculations accompanying Government letter.
1	2	3
Concentration in food-crops canals	90% of suitable area.	60 %
Nature of crops	All light: needing water at 25 days interval (except in the case of rice-gram pattern).	Mixed as in existing canal i.e. with interval between waterings 10 days for some and 25 for others.
No. of waterings required by light crops (like jwar).	2 to 3 waterings per season	125/25 i.e. nearly 5

* NOTE:- The principle of adopting A.I./D.C. as basis for calculating discharging capacity only and of duty as basis in calculating quantity of water required (whether from storage or from river) will explain the difference between columns 2 and 3.

8. I also find the A.I./D.C. adopted in the calculations received with Government letter is 3.25 even for mixed crops, including rice and 50% concentration, while I had adopted that figure for purely light food-crops with 75% concentration in working out figures of area to be irrigated and the

financial...

financial forecast for miles 0 to 44 of Ghataprabha Left Bank Canal vide this office No.Gh.L.B.182 dated the 28th Jan.1948. I am aware that Government want me to modify and verify the calculation sheet sent by them but with such differences in basic principles and assumptions, I feel diffident of whether my assumption of 3.25 in my letter of 28th January 1948 was unacceptable to Government and whether or not I should change figures for conditions as envisaged in the Government note, to a much lesser figure.

Government have not given any guidance about these points: In fact the points raised by me in the two letters submitted in this case, and actually the figures and assumptions adopted in Government note appear to indicate that my method of working, arguments, basic figures are unacceptable to Government.

9. Before, therefore, I venture to modify the Note received with the Government letter, I would request clarification on the following points.

(1) Storage site: Ajra only: Daddi only: or both.

(2) Pattern of Irrigation : { (A) Half area under Kharif & half under Rabi in a given year;
(B) 2 crops per acre per year;
(C) Rice-gram

Note:- In the case of A above, Distribution of Kharif and Rabi to be by alternate Distributaries so as to obtain full concentration in the season or mixed uncommanded areas some under Kharif and the remaining under Rabi in the same Disty. and in the same year.

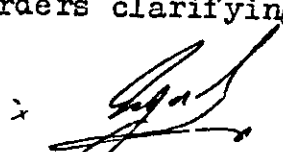
for Pattern A + B

(3) Type of crops: { (a) All light (as assumed by me);
(b) Light & heavy mixed (as assumed in Govt.note)

(4) No.of water-ings for light crops: { (i) About 2 to 3 normally (2 timely showers being assumed)
(ii) 5 so as to ensure a bumper crops even in the worst year i.e., with no rain worth the name;
(iii) ~~(iii)~~

Note:- The latter does not appear to fit in with the basic assumptions accepted by Govt. viz. that schemes should be based on run-off of two deficit years in 25.

10. The note required by Government will be submitted on receipt of Government orders clarifying the points mentioned above.


Superintending Engineer,
Karnatak Irrigation Circle.

4/12/74

2/2/4

P. W. D.
File No. 8151/36
Serial No. 22781

2nd. 213 II
4/4 2 4 4 5

I.B. (II)P. 50.

Submitted for orders with ref. to the G.L.
p. 43 ante
NO. 8151/36-I.B. (II), dated the 1/3-49 and the
H 21-26
notes underlying it.
Tmo. DE (1)

B.M.
22/4/49

The S.E. K.I.C. was requested to offer his remarks on the note page 41-42 ante containing the details of Ajra Storage + G.L. B.C. as worked out in the Secretariat + forwarded to him as per page 39 ante.

The S.E. under paras 2 to 6 of his letter d 31 $\frac{3}{49}$ page 45 ante, however commented on his original letter p 11 to 19 ante and these paras need not be considered in view of the orders passed at pages 25-26 ante.

In paras 7 & 8 p 46 ante the following differences between his suggestions & the Secretariat note are recorded.

	Basis of S.E.'s calculations	Assumptions of the Secretariat made in the note.
(1) Concentration in food crops canals.	90% of suitable area.	60%
(2) Nature of crops.	All light; needing water at 25 days interval (except in the case of rice grain pattern).	Mixed; (as in existence canal i.e. with interval between waterings 10 days for some + 25 for others.
(3) No. of waterings required by light crops (by power)	2 to 3 waterings	(i. it is assumed $\frac{25}{2}$ days in the note) $12 \frac{5}{25} = 5$ nearly.
(4) A/P.C.	3.25 even for purely light crops with 75% concentration	3.25 even for mixed crops including rice + 50% concentration

In para 9 the S.E. wants clarification on the following points.

- (1) Storage site. Apra only; Daddi only. or both.
- (2) Pattern of Irrigation
 - (A) Half area under kharif + half under Rabi in a given year.
 - (B) 2 crops per acre per year.
 - (C) Rice. gram.
- (3) Type of Crops.
 - (a) All light.
 - (b) Light & heavy & mixed.
- (4) No. of waterings for light crops.
 - (i) about 2 to 3 normally (2 timely showers being assumed)
 - (ii) 5 so as to ensure a bumper crop even in the worst year i.e. with no rain worth the name.

_____ x _____
 The S.E. may therefore be informed that what is wanted by Govt. is that

- (1) No perennial irrigation be allowed.
- (2) The Canal should be so projected as to give one season crop to as large an area as possible and all lands under command should take water
- (3) The Storage at Apra should suffice only for growing food crops in Kharif and Rabi seasons if necessary, by making it compulsory for all land owners whose lands come under the command of the Canal to take water from it.
- (4) The length of the Canal should be as that sanctioned today which is 44 miles, commanding an area 2,54,000 acres + Q of canal 1500 cusecs or such as would be necessary for items 1 to 3 above
- (5) Storage necessary for above at an economical site
- (5) All/Dc 3.25 at Canal head

7) The remaining assumptions may be made in such a way that minimum modifications will be required in the project works that are sanctioned today. or with suitable minimum additional expenditure in the project, an improved forecast can be

With reference to the specific queries made by the S.E./K.I.C. he may be informed as under

(i) Storage :- Storage may be either at Ajra or Hadalga, whichever is cheaper. Capacity of the storage may be equal to next higher run-off than the two worst years of the observed discharge.

(We have enquired of the C.W.R.C. and the Ch. Engrs Mysore and Madras about the practice followed by them in this respect; but for the present assumption as above may be made to work out the storage capacity.)

(ii) & (iii), Pattern of crops and Type of crops

Seasons only; 60 percent concentration in any season with 40 op under light crops and 20 op under heavy, on the canal as a whole

(iv) Number of Waterings

4 for light crops
8 for heavy crops.

General :- The S.E./K.I.C. may also be informed as below.

To

The S.E., K.I.C.

P.W.D.,
B.C., 11 July 1949

Subject :- Ghataprabha Valley Development Project.
A purely food-crops scheme.

p. 45 ante

With ref. to your letter NO. Bm/Daddi, dated the 31-3-49, on the subject mentioned above, I am directed to clarify the several points raised by you therein, as under:-

(i) Storage:- Storage may be either at Ajra or at Hadalga, whichever is cheaper. Capacity of the storage may be equal to the next higher run-off than the two worst years of the observed discharge.

(ii) Pattern of irrig. and types of crops: Seasonals only. 60% concentration in any season - 40% under light crops and 20% under heavy crops - on the canal as a whole.

(iv) ^{Number} of waterings: Four for light crops and eight for heavy crops.

(v) General:

(a) A.I/D.C. should be assumed with due regard to nature of the tract, soils, layout of area, etc.

(b) Command and length of canal reqd. to utilise fully the storage at Ajra or at Hadalga should be calculated.

(c) It should be verified as to whether

To be typed as M.I.
D.C.

Area irrigated
Discharge in cusecs.

the capacity of the canal as designed at present
will suffice for the proposed imprs. or will require
any modification therein. If so, rough details of
the modification reqd. with ^{near probable} cost should be reported.

You are requested to submit early your remarks,
p 43 ante.
called for in G.L. NO. 8151/36-I.B.(II), dated the 16-3-49,
as all the points raised by you are now clarified.

to A.

Nil.

By order etc.

N.
T.49

H-1-1-1-2

D.S.

~~1-1-1-2~~ 2-1-1-5

Letter.

No. 8151/36-I.B.(II).

Public Works Department,
Bombay Castle, 11th July 1949.

To

The Superintending Engineer,
Karnatak Irrigation Circle.

Subject:- Ghataprabha Valley Development Project:
A purely food-crops scheme.

With reference to your letter No.Bm/Daddi, dated the 31st March 1949, on the subject mentioned above, I am directed to clarify the several points raised by you therein, as under:-

- (i) Storage.- Storage may be either at Ajra or at Hadalga, whichever is cheaper. Capacity of the storage may be equal to the next higher run-off than the two worst years of the observed discharge.
- (ii) & (iii). Pattern of irrigation and types of crops.-
Seasonals only: 60% concentration in any season - 40% under light crops and 20% under heavy crops.- on the canal as a whole.
- (iv) Number of watering.- Four for light crops and eight for heavy crops.
- (v) General:
 - (a) A.I/D.C. should be assumed with due regard to nature of the tract, soils, layout of area, etc.

(b)

- (b) Command and length of canal required to utilise fully ~~fixing~~ the storage at Ajra or at Hadal-a should be calculated.
- (c) It should be verified as to whether the capacity of the canal as designed at present will suffice for proposed irrigation or will require any modification therein. If so, rough details of the modification required with their probable cost should be reported.

2. You are requested to submit early your remarks, called for in Government letter No. 8151/36-I.B.(II), dated the 1st/10th March 1949, as all the points raised by you are now clarified.

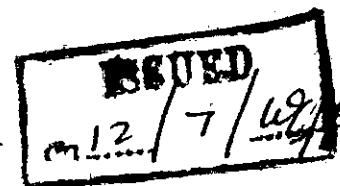
By Order of the Governor of Bombay,

Ad

(d. 11/7/49)
Deputy Secretary to the Government
of Bombay, Public Works Department.

D.A.-Nil.

2
BKR.11/7/49



D.O. No. Bm/Daddi.

Office of the
Superintending Engineer,
Karnatak Irrigation Circle,
Dharwar: 16th August 1949.

Hear Joglekar,

Subject: Ghataprabha Valley Development
Project, ~~and~~ A purely food crops
scheme.

As per Government letter, P.W.D. No. 8131/
36-I.B.(I), dated 11th July 1949, the capacity
of the storage at Ajra or Hadlaga has been --
ordered to be fixed at the next higher run off
than the two worst years of the observed dis-
charge. It is presumed that this decision has
been arrived at after considering the replies
received from Mysore and Madras Governments, also
Central Waterpower, Irrigation and Navigation
Commission, New Delhi to whom a letters were
addressed by Government under Government letter
P.W.D. No. 9289/36-I.B.(II) dated the 27th April
1949 regarding fixing the capacity of reservoirs
for irrigation schemes. It would be interesting
to know the principles these different authorities
adopt. Could you enlighten me on this point?

I do not think the
replies have been so
far received from those
Govts. Anyway, please put
up taken care + no letter to me
Saturday 20/8/49

Yours sincerely,

K.V. Joglekar

Shri. K.V. Joglekar, B.E., B.S.E.(I),
Deputy Secretary to Govt. of Bombay
P.W.D. Secretariat, Fort, BOMBAY.

mkr

Supd 5-3 (4)

9/10/8

P. W. L.	
File No	9151/36 -
Serial No.	54067

8151/36

P.N.D. 54067

Mr Nair's presumption is not correct. He may be informed accordingly. Replies have been received from the Madras & Mysore Govts to G.O. No. 9289/36 J.B.(II), dated the 27-4-49 in regard to the fixing of capacity of reservoirs for irgn projects - and not from the C.W.I.N.C. Copies of the replies may be sent to Mr Nair for information.

WRI

19-8-49

K2918149

D.S

D.O. No. 8151/36 J.B.(II).

P.N.D., Secy.,
Bombay, and Aug. 1949

Dear

Your D.O. letter No. Bm/Daddi of the 16th inst.

Your presumption is not correct. ~~Express A~~ copy of the replies received from the Madras and Mysore Govts. re. the fixing of capacity of reservoirs for irgn projects ~~and~~ enclosed herewith for your information. Reply from the C.W.I.N.C. is still awaited.

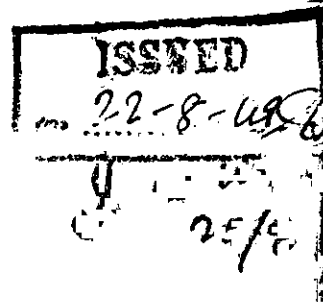
File 9289/36
66-29431
C.S

D.A. Copy
of letter No.
2780/49 AER
dated 10-6-49
from the Chief Sgr
for Irign, Madras
and letter No 4025 KCB.
dated 23-6-49
from the Chief Sgr
Mysore Govt.

A. G. Nair Esq. B.E.
S.E., K.I.C.,
Pharwar.

WRI
19-8-49

Yours



K2918149

18/10
2. P.

I.B.C.(11). O.N.

The S.E., K.I.C. expedited under no. 8151/36 I.B.C.(11),
dated on 19th October 1949, marked 'Urgent'.

B.D.
19/10/49
19-10-49

19/10

Issued J.C. 2
on 19/10/49

23/5
23/5
23/5

I.B. (11)

Resubmitted with a
draft Express letter for approval

27.5.50.

Rm
20/11/50

Express Letter 61

8151/36/54067

From - Bomworko, Bombay.

To - S.E., Karnatak Irrigu. Circle.,
Dharwar.

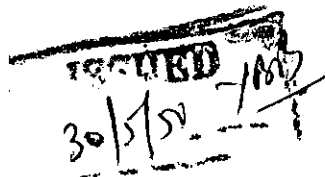
No. 8151/36-2B.(II)

P.N.D.
B.C. (May No. 1)
30 May 1950.

Please refer to G.L. No. 8151/36-2B.(II), of 11-7-49,
and submit urgently your remarks
called for in G.L. No. 8151/36-2B.(II), of 1st/10th ^{p43} March 1949, regarding "Chhatrapatha Valley
Dev. Project: A purely food crops scheme".

27.5.50

A. Secy. to the G.O.B.



Issue forwarded
30/5/50

62
~~Clarant (1-7-50)~~
31/5

in N.

20/7

SB. (II)

Resubmitted with a draft
Ex. letter for approval.

8.50

Ad.
2/8/50.

W. H. Key

Express Letter

8151/36/54067

From - Bomnworks, Bombay.

To - S.E., Karn. I.C.

No. 8151/36-2B.(II)

P.W.D.
B.C. (Blay No. 1),

13th Aug. 1950

Please refer to Govt. Express Letter No. 8151/36-2B.(II),
dated 30-5-50, and submit immediately
your remarks on "Ghataprabha Valley Dev.
Project: A purely food-crops scheme" called for
in G. L. No. 8151/36-2B.(II), of 1st/10th March 1949.

E
2.8.50

A. Secy. to the G. of B.

YB13
M4D
3/8/50

Issued
2/8

Issue ~~now~~
3/8

Await (49-0)
4/8

Duplicate of p 17 pri -

No. Gh.L.B.

Office of the Superintending Engineer,
Karnatak Irrigation Circle,
~~Gamp~~ via Dharwar, 9 August 1950.

To

The Secretary to Government,
Public Works Department,
Bombay.

Subject: Ghataprabha Valley Development Project -
A purely food-crops scheme.

Reference: Government letter P.W.D.No.8151/36-I.B.(II)
dated the 3rd August 1950.

2. The final report is being prepared in this office and
the same will be submitted to Government shortly.

Kanag. Sr

Superintending Engineer, K.I.C.

Through: ✓

The Chief Engineer to Government, Public Works Department,
Bombay-1 with compliments.

BR/8-8. *hu*

No. Gh.L.B.

Office of the Superintending Engineer,
Karnatak Irrigation Circle,
~~Camp~~ via Dharwar, 9 August 1950.

To

The Secretary to Government,
Public Works Department,
Bombay.

Subject: Ghataprabha Valley Development Project -
A purely food-crops scheme.

Reference: Government letter P.W.D.No.8151/36-I.B.(II)
dated the 3rd August 1950.

2. The final report is being prepared in this office and
the same will be submitted to Government shortly.

Handwritten signature
8/8

Superintending Engineer, K.I.C.

Through:

The Chief Engineer to Government, Public Works Department,
Bombay-1 with compliments.

BR/8-8. *Handwritten initials*

I.B. (II)P.W.D.Await.B.M.
17/8/50P.
18/8/50.

J.A.S

Await (20-9-50)
18/8I.C.U.
14/8P. W. R.
8151/36.Await (25-10-9.)
30/9J.B. (II)P.W.D.

The S.E. Kar. J.C. has been expedited under
 No. 8151/36-J.B. (II) dated 14 20-9-50.
 28.9.50. J.A.S.

8151/36
66196

I-B II

1287.

No.B.m./Daddi

Office of the Superintending Engineer,
Karnatak Irrigation Circle,
Dharwar, 17 October 1950.

To

The Secretary to Government,
Public Works Department,
Bombay.

Subject:- Ghataprabha Valley Development
Project - A purely food crops
Scheme.

P. 68 a/c

Reference: Government Reminder P.W.D.
No.8151/36-I.B.(II), dated the
29th September 1950.

2. The report in this connection is being
finalised and the same will be submitted shortly.

Harvey 26/10

7
Superintending Engineer,
Karnatak Irrigation Circle.

[Signature]

RNG.

8151/36/86246 2V

J.B. (II).

PWD

Await

21.10.50.

(25/10/50.)

Await (1-2-50)
26/10 show Kul
9/12

J.A.S.

9 B. (II)
19/10

710 56
0.76
22.12.50

18/10
4

8151/36.

86246

I. B. II.

The S.E.K.I.C expedited under
8151/36 I.B. (II) dt 12.50.

1K
9/12/50.

Await (10-1-51)
2

300?
11/12/50

170
1550-55 10 50
22/12

No. Bm/Daddi

Office of the Superintending Engineer,
Karnatak Irrigation Circle,
Dharwar, 28th Decr. 1950.

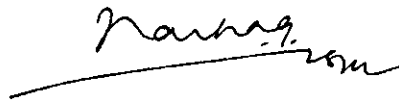
To

The Secretary to Government,
Public Works Department,
Bombay-1.

Subject: Ghataprabha Valley Development Project -
A purely food crops scheme.

Reference: ^{1. 68} Government Reminder P.W.D.No. 8151/36-I.B.(II)
dated the 29th Septr. 1950 and Expeditor No.
8151/36-I.B.(II) dated 12th Decr. 1950. 70

The report in this connection is being finalised
and the same will be submitted shortly.


Superintending Engineer, K. I. C.

BR/28-12.

IB (M)

Await
8/1/57

Recd.
9-1-57

as

Shri Bhande
X letter
11/3

Await (10-2-57)
9/11

IB (II)

The S.E. KOC may be expedited
as per draft put up.

3043
2/3/57

12/3/57

Recd.
P. W. D.
File No. 8151/36
Serial No. 644

I. A. Seny

I - II

- 1 - 51

8151/36/644

Express Letter

From: Bomworks, Bombay

To: S.E., K.G.C., Dharmwar.

No. 8151/36 - 1B (II)

P.W.D.

A.C. (B'way No. 1) 17th Mar. 1951.

Ref: - Corresp. ending with your letter No. Bom/Daddi

dt the 28.12.50.

2. Pl expedite ~~with prompt~~ the report in respect of
the Ghataprabha Valley Development Project; ~~a~~ fully
purely food crops scheme. ~~The matter is pending for~~
~~long time.~~

Recd.
12/3/51

Shri. A. Sanyal
17/3

A. Sanyal to Govt., P.W.D.

16/3

EXPRESS LETTER.

From - Bomworks, Bombay.

To - Superintending Engineer,
Karnatak Irrigation Circle, Dharwar.

No.8151/36-I.B.(II).

Public Works Department,
Bombay Castle (Bombay No.1),
17th March 1951.

Reference: Correspondence ~~at~~ ending with your letter
No. ~~B~~/Daddi, dated the 23th December 1950.

2. Please expedite the report in respect of the
Ghataprabha Valley Development Project, a purely food crops
scheme.

Issued
17/3/51

Q
17/3/51

Assistant Secretary to the Government of Bombay,
Public Works Department.

2
VMW.
17/3/51.

Has
17/3/51

Given - (17-4-51)
17/3

No. Bm/Daddi.

Office of the Superintending Engineer
Karnatak Irrigation Circle,
Dharwar, 30 April 1951.

To

The Chief Engineer,
Public Works Department,
Bombay.

Subject: Ghataprabha Valley Development Project:
A purely food crops scheme.

Reference: Government Express letter P.W.D.No.8151/36-
-I.B.(II) dated the 17th March 1951.

The report is under scrutiny in this office and the
same will be submitted shortly.

Superintending Engineer, K. I. C.

BR/30-4.

GSI

MIP 1151/38955

J Pr

P.W.D.

Submitted.

- 2 As this is an ad-interim reply, the letter may not perhaps be signed reluctantly for authentication.
- 3 The report from the SE, K.I.C. may be awaited.

8/5/36

221
13/5/36

Kmla
9-5-51
11

116-7-38955
16/5

4/5

AAS

Surf K
2/5

P. W. D.
MIP 1151
38955
J
3-5-11

MIP 1151
38955

J. Be.

P.W.D.

The S.E., K.I.C., expedited under No: MIP 1151.
dated the 6th September 1951, marked very

urgent.

YR1
6-9-51

ISSUED
7-9-51

KDH
5/9/51.

Issued info.
6/9
~~42nd 2nd 2nd 2nd~~

Supdt.

Contn (- (8-11-51)
8/9

No. Bm/Daddi.

Karnatak Irrigation Circle,
Dharwar: 6. October 1951.

To,
The Chief Engineer,
Public Works Department,
Bombay.

Subject: Ghataprabha valley Development Project -
A purely food crops scheme.

Reference: Continuation of this office No.* Bm/Daddi
of 30th April, 1951

The report is being scrutinised in this office. This
will be submitted to Government shortly.

anked. 3/10
2
Superintending Engineer, K.I.C.

No. Bm/Daddi

Office of the Superintending Engineer,
Karnatak Irrigation Circle,
Dharwar, 14th June 1952.

To

The Chief Engineer to Government,
Public Works Department, Bombay-1.

Subject:- Ghataprabha Valley Development
Project: a purely food crop
scheme.

Reference: Government expeditor No. MIP 1151 J,
dated the 10th June 1952.

The report in question is under scrutiny in this
office in the light of the Koyna Scheme of Pattern of Irriga-
tion. It will be submitted to you as early as possible.

Rainey. mub

Superintending Engineer, K.I.C.

ms
14/6

MIP. 1151/57137

P.W.D. 721

J.B.

Await

AW
20/6/52

AW
20.6.52.

Supdt.

J
The S.E., K.I.C. expedited under
No. MIP. 1151 - J dt. the 1-8-52

AW
11/8/52

AW
1-8-52

J
18-6

P. W. D.

File No. MIP 1151

Serial No. 57137

Issued
21/8/52

No. Bm/Daddi

Office of the Superintending Engineer,
Karnatak Irrigation Circle,
Dharwar, 9th Aug. 1952.

To

The Chief Engineer to Government,
Public Works Department, Bombay-1.

Subject:- Ghataprabha Valley Development Project:
A purely food crop scheme. P 84

Reference: Government Expeditor No. MIP-1151-J,
dated the 1st August 1952.

The report in question is being finalised and it
will be submitted to you after some time.

Karkey.
Superintending Engineer, K. I. C.

BR/8-8.

98/9/5

MIP 1151/75160

P. W. D.

J. B.

Await.

~~DD~~

14/8/52

hug

14-8-52

supdt

~~11/11/52~~

11/11/52

11/11/52

11/11/52

11/11/52

11/11/52

J. B.

The G. E., K. I. C. expedited under
No. MIP: 1151/75160 - J. dt. 16-9-52

P. W. D.
File No. MIP 1151
Serial No. 75160

~~DD~~

15-9-52

hug

15-9-52

15-9-52

3/10

supdt.

ISSUED

16-9-52

183

71P.1157 / 75-160

P.W.D.

J. B. A.

Resubmitted with a draft
for approval.

W.

6/10/52

W.
6/10/52

A.S. (III)

Express Letter

From .. Bomwarles, Bombray.

To .. Mr. S.E., K. I.C., Dhawar.

No. MIP. 115-1.-J

P.W.D.,

B.C. (B'bay No. 1)

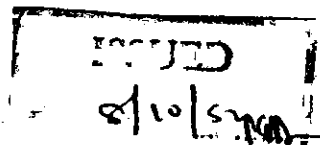
7th Oct. 52

Reference correspondence ending
with your letter ^{P. 84} No. Bm/Daddi,
dated the 9-8-52, regarding
Ghataprabha Valley Development
Project - A purely food crop
scheme.

Schenck.

2. Please expedite submission
of the report in the matter

Superintendent, P.W.D.,
Bombay



[Signature]

10/11

No.BM/Daddi.

Karnatak Irrigation Circle,
Dharwar: 27 October 1952.

To

The Chief Engineer to Government,
Public Works Department,
Bombay.

Subject:- G.V.D. Project: A Purely food crop scheme.

Reference:- Govt. express letter, P.W.D., No.M.I.P.
18/1151-J dated the 7th October 1952, to
this office.

The necessary details are being worked out. A report
in the matter will therefore be submitted as soon as
possible.

Narayan
Superintending Engineer, K.I.C.

VWJ/28-10.

ms
28/10

MIP. 115-1/104130

P.W.D.

J. Br.

Await.

Q.
6/11/52

Aug
6.11.52.

~~2~~

✓
Aut. 10/1
3111

J. Br.

✓
The S.E., K.S.C. expedited order
(No. MIP 115 J dated the
24-11-52.

Q.
28/11/52

Shp/c
2211

Q.
28/11/52

J. Br.

P.W.D.

The S.E., K.S.C. expedited again
under No. MIP 115 J dt. 12/29-153.

Q.
29/11/53

Supdt.

Supdt.

✓
K.P. x'p' hnd
J.B.

Q.
29-11-53
JED
29-11-53

J.
4-11

MIP 1151
104130

Q.
24/11/52

Supdt.

3 J 11 52 ✓

MIP 1151/104130

P. W. D.

J. Br.

The Superintending Engineer K.I.C may
be expedited as per draft ^{P. 95} Express letter put
up.

RVP:
6/3/53.

De
6/3/53

Supd.

min
6/3

Express letter 95

From: Bomworks, B bay.

To: The Superintending Engineer,
Karnataka Irrigation Circle.

No: MIP 1151 / 104130 g

P.W.D.

B.C. (B bay 1)

6th Feb. '53

Ref: Govt. Memorandum¹⁹² No. ~~1151~~ 1151-53 dt. 29-1-53.
your letter no. Bm/Added/Tm 29-10-52

Please submit ~~the~~ immediately the report
on G.V.D. Projects: A purely food crop scheme.

Superintendent.

P.W.D.

TVP.
6/3/53

EXPRESS LETTER.

From : Bomworks, Bombay.

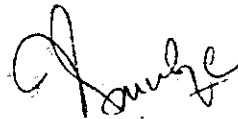
To : The Superintending Engineer,
Karnatak Irrigation Circle.

No.MIP 1151/104130 J.

Public Works Department,
Bombay Castle (Bombay No. 1),
6th March 1953.

Reference: Your letter No.BM/Daddi, dated the 29th
October 1952.

2. Please submit immediately the report on Ghataprabha
Valley Development Projects : A purely food crop scheme.



Superintendent, Public Works Department,
Secretariat.

ISSUED

Date...

2-3-53

ABG

2

AG/6.3.

P.W.D.
"J"

p. 7

In G.L.No.8151/36-I.B.(II), dated the 22-10-48, it was suggested that instead of allowing any perennial irrigation, the proposed storage at ^{Agra} ~~Agra~~ might be used only for growing food crops in Kharif and rabi seasons if necessary by making it compulsory for all land owner whose lands come under the command of the canal to take water from it. The S.E., K.I.C. was asked to offer his remarks on this proposal and also how this proposal would fit in with the Ghataprabha Left Bank Canal as proposed to be constructed. The object behind this was to know whether the Ghataprabha Left Bank Canal as designed - discharge, length etc. - would be suitable on any modifications would be required if it has to be worked as an eight month's canal with Agra Storage.

The remarks of the S.E. in this connection is still awaited. However, as the work on the Ghataprabha Left Bank Canal is ⁱⁿ full swing and as the first eight miles have already been completed and open to irrigation it may perhaps be considered not necessary to await any further report from the S.E. in this connection. It may also be mentioned here that the proposed sites for the construction of the dam have already been inspected by the American expert on Dams, Dr. Savage, and investigations are being carried out.

Thro' D.E.(I)

S.S./25-4-53.

[Signature]
25/4/53

D.S.(9+E)

C.F (1)

(as executed)

Are the designs of the Canal (Section 4)
- the in line? 27/4

MIP: 1151/1041

J. B. n.

Resubmitted with reference
to the D.S. (G+E); query overleaf.

2. In this connection it may
be stated that the designs of
the canal as executed (sections etc.)
are not available in this office.

Thro' D.E. (I)

At.

28/11/53

18/1/5

S.E.'s report may be taken for
re-^{canal} designs finally adopted for execution.

18/2/5

~~D.S. (G+E)~~

2/8.5.53

C.E. (I)

J. B. n.

Resubmitted with a
draft for approval.

Shri D
611

Thro' D.E. (I)

At.

7/5/53

18/7/5

No. MIP. 1151-J

101

P. W. D.

B. C. (B. Bay No. 1)

8 May 53

To

The S. E. K. E. C.

Subject: Ghataprabha Left Bank
Canal Project: Canal
designs of the -

I am directed to request
you to submit a report regarding
the canal designs finally adopted
for execution of the Ghataprabha
Left Bank Canal and to state

whether...

ISSUED

Date..... 5/5/53

whether the canal as designed —
discharge, length etc. — will be
found suitable if it has to be
worked as an eight month's canal
with Agra storage

✓
Aut 28/10
81/6

By order etc.

For H. Secy to the G. of B. D. A. Nil
P. W. D.

~~PP~~
P/5/1/3

Aut 5/16
a/b

A D
5/16

112
The S. E. K. I. C. expedited
under No. MIP. 1151-J, dt.
the 6-6-53
112
16
6/6
11
170153
170153
170153

Letter

No.Gh.L.D.

To

Karneak Irrigation Circle,
Post Box No.28,
Dharar, 13th June 1953.

The Chief Engineer to Government,
Public Works Department, (Irrigation),
Bombay.

Subject:- Ghatapmbha Left Bank Canal Project:
Canal designs of the

Reference: Government letter P.W.D.No.MIP 1151 J
dated the 8th May 1953 and p.101
subsequent expeditor.

The report called for is awaited from the
Executive Engineer, G.L.B.C.Dn. who have been expedited
for its early submission. On its receipt in this office,
it will be submitted to Government after scrutiny.

M. Madhavan
13/6/53
Superintending Engineer, K.I.C.

MIP.1151/70799

P.W.I

J.P.S.

A. ware.

QW.
18/6/52

2 (in 15)

Supdt.

7/18/1

J
17/6 J

MIP.1151

70799

J

Supdt. 17-6-52

in P.
9/1
Aug (6)
1956
J.P.S.

The S.E., K.I.C. expedited
under No. MIP.1151/70799-J. dt.

the 15-7-53

QW.
18/6/53

2 (in 17)

ISSUED
Date 15/7/53

105

MSP 1151/70799

P.W.D.

J.B.

The S. E. K. G. C. again expedited under

No. MSP 1151-5, dtd the 20th Aug 1953

ETO
19-8-53

92
191203

Supdt.

111
~14

10077

ML
10077

8110

MIP 1151/90999 100

J. Br

P. W. D.

The S. E, K. G. C. may be
expedited as per ^{P. 1077} draft.

express letter put up for
approval.

ETC
8-10-33

L
8/10/33

Supdt.

Express Letter

From — Bannu, Pibay.

To — The S.E., K.G.C.

No. MLP 1151-J.

P.W.D.,

B.C., (Pibay No. 1)

8th Oct. 1953.

Refce. — G.L. No. MLP 1151-J, dtd. the
8-5-53 and subsequent
expenditures of even Nos. dated
the 15-7-53 & 20-8-53. Re
G.L. B.C. Project : Canal
Designs of the —

2. Pl. expedite the submission of
your report, in the matter.

9/10/53

E.T.
10/53

mm
Scho Supdt, P.W.D.

Ghataprabha Valley Development Scheme

Hadalgga Storage and the Ghataprabha Left Bank Canal -

The Ghataprabha Left Bank Canal as now sanctioned and under construction, has a length of 44 miles with two branches of 31 miles in the aggregate. The main canal has a head discharge of 1500 cusecs. The total command is 2,57,900 acres(gross).

The first dam now proposed to be built in the Ghataprabha Valley is at Hadalgga. The storage formed there will have a capacity of 32,500 M.cft. The point now to be considered is whether the Ghataprabha Left Bank Canal as being constructed would be suitable or any modifications would be necessary if it has to be worked as an eight months' canal by utilising the contemplated storage at Hadalgga.

The Ghataprabha River and its two principal tributaries - Hiranyakoshi and Tamraparni river - have been gauged and their average annual runoffs are -

(i) Hiranyakoshi river at Ajra	38,700 M.cft.
(ii) Ghataprabha river at Hadalgga	37,900 "
(iii) Tamraparni River at Rajgoli	30,000 "

It is also estimated that the annual runoff at Dhupdal weir above which, all the three rivers have their confluence, is about 1,20,000 M.cft.

From these river flow gaugings, it may be said that each river is contributing roughly one third of the annual flow at Dhupdal. Further, from the daily discharge observations made at Dhupdal, it is estimated that the river flow at the weir after construction of the proposed storage at Hadalgga will be as follows:-

The discharge on the average will be more than 2000 cusecs from 15th June to end of August and will fall to 2000 cusecs on or about 10th September. Thereafter, the flow will go on decreasing as indicated below:-

On 10th Sept.	2000 cusecs
15th Sept.	750 "
15th Oct.	350 "
15th Nov.	250 "
15th Dec.	100 "
15th Jan.	50 "
15th Feb.	Nil

In the absence of any storage in the valley, the canal will have to function only in the monsoon with watersupplies from river flow diverted into it at the Dhupdal weir. With the storage, it can be worked as an eight months Canal.

• • Storage.....

Storage required to run the Canal as eight months' canal of 1500 cusecs at head:-

Day	R.flow in cusecs	Period in days	Draw off from sto- rage in cusecs	Average draw off in cus.	Total storage to be drawn in day cusecs
1	2	3	4	5	6
10th Sept 2000		5		375	1,875
15th "	750	30	750	950	28,500
15th Oct.	350	31	1150	1200	36,200
15th Nov.	250	30	1250	1325	39,750
15th Dec	100	31	1400	1425	44,175
15th Jan	50	31	1450	1475	44,725
15th Feb			1500		
Total					1,96,225 day cusecs

*Requirements
of work rule
& present eight
months irrigation
on work canal
to which amt is
committed seems
to be lost
18/11/53
This is known as
minor aspect
for...*

Storage actually required -

1,96,225 D.C. = 17063 M.cft.

Adding 10% losses in the river channel and 3 M.cft. per day on the average as evaporation and absorption losses in the Dhupdal lake and some 3500 M.cft. in the Hadalga storage by way of evaporation etc., the gross storage required will be -

For supplying canal to run full upto 1500 cusecs	17063 M.cft.
Add 10% losses in river channel	1706 "
Losses in Hadalga Storage	3500 "
Loss in Dhupdal lake -- 158 x 3 M.cft.	474 "
Total Storage	22743 M.cft.
or say	23,000 M.cft.

The storage of Hadalga is being designed for 32,500 M.cft. So, it is desirable to increase the canal capacity for irrigation. If the Canal capacity is increased to 2000 cusecs at the head, the additional storage required would be -

From 10 Sept. to 15 Sept. $250 \times 5 = 1250$ D C
From 16 Sept. to 15 Feb, $500 \times 153 = 76,500$ DC
Total Q = 77750 D.C. = 6761 M.cft.
Adding 10% losses in the river channel
the total storage(additional) is
= 6761 M.cft. + 676 M.cft.
= 7437 M.cft. or say 7500 M.cft. So.....

So, the storage required by the Canal of 2000 cusecs ~~the~~ addition to the river flow if worked as an eight months canal is -

23000 M.cft. + 7500 M.cft.

= 30,500 M.cft.

The proposed storage of 32,500 M.cft. at

Hadalga will, therefore, be practically fully utilised if the Canal capacity is increased to 2000 cusecs at head.

The main canal as sanctioned has a head discharge of 1500 cusecs. But the capacity of canal as is now being constructed can be increased to 2000 cusecs by merely raising the banks. The masonry works now under construction as well as those to be built hereafter, have been so designed as to admit of this change without any structural modifications, either involving whole sale reconstruction or only remodelling.

Pattern of Crop.

Pattern of irrigation and type of crops as per Government Letter Public Works Department No. 8151/36-I B(II), dated 11th July. 1949.

(a) Seasonals only

60% concentration in any season of which 40% under light crops and 20% under heavy crops - on the canal as a whole.

b) Number of waterings -

4 for light crops and 8 for heavy crops in a season.

(c) $A = I/D \cdot C = 3.25$ for Ghataprabha area

Command and length of Canal -

Canal length	G.Command in acres	Cumulative G.C. from the beginning of canal in acres.
Main Canal		
Mile 0' - 31½	78500	78500
North Branch	89700	168200
Main Canal		
mile 31½ - 44½	34000	202200
Jamkhandi Branch	55700	257900
Main Canal		
mile 44½ - 62½	47700	305600
Ghani Branch	14000	319600
Main Canal		
mile 62½ - 72½	17800	337400
Bilgi Branch	48800	386200
South Branch	59600	445800

It.....

1. in following construction seen to have been lost sight of that important (i) with the storage at Hadalga the full minimum discharge in the river will divide over the dam (ii) Although this method is supplementary to the main discharge tank construction but the main discharge tank (banks) with the earthen banks & with the main masonry structure. There will be further storage from lower storage.

0.8M/53.

It has been shown above that the storage of 32,500 M.cft. would be fully utilised by an eight months' Canal provided the main canal capacity is increased to 2000 cusecs.

It is assumed that -

Kharif seasonals watered once in 25 days

Rabi Seasonals watered once in 25 days

Two seasonal crops watered twice in 25 days

* Area that can be irrigated in each season reduced to seasonal basis will be -

2000 cusecs x 3.25 x 25 = 1,62,500 acres

That is to say -

Kharif seasonals 80,000 acres say

Rabi Seasonals 80,000 " "

Two seasonal crops 40,000 " "

In any one season, therefore, an area of 1,20,000 acres will be irrigated and in both Kharif and Rabi seasons, 2,00,000 acres will be irrigated on the Canal as a whole.

The storage and the G.L.B. Canal is intended to extend irrigation facilities to the famine areas of Bijapur in particular. The second section from miles 45 to 73 is contemplated to extend irrigation further into Bijapur and a rough project is also ready.

The whole canal of 73 miles together with its branches, commands 4,45,800 acres. The irrigable command at 80% will be 3,56,640 acres.

The concentration of irrigation on the 73 miles canal in each season will be $\frac{120000}{356640} = 33.65\%$ or say 34%

If irrigation in both seasons is considered, the concentration on the canal as a whole will be -

$$\frac{200000}{356640} = 56\%$$

on this basis of concentration, the discharge to be consumed in the first 44 miles of canal now under construction is as worked below -

Gross command 2,57,900 acres

Irrigable command at 80% 2,06,320

Irrigated area at 34% concentration 70,149 in a season (Kharif or Rabi)

that is -

Rabi or Kharif Seasonal 46,766 acres.

Two seasonal crops 23,383 "

$$\frac{46766}{25 \times 3.25} \quad \frac{23383}{12.5 \times 3.25}$$

= 1151 cusecs.

Of the 2000 cusecs discharge at head 849 cusecs will be available for utilisation in the next section from mile 45 to 73 for the benefit of famine area mainly in the Eijapur District.

Capacity of the North Branch(Raybag)

Gross command 89,500 acres

Irrigable area at 80% 71,600 "

Concentration in each season - 34%

Irrigation area $71600 \times \frac{34}{100} = 24344$ acres

This will comprise of -

Khharif or Rabi Seasonal 16230 acres

Two seasonal crop 8115 acres

$$Q = \frac{16230}{3.25 \times 25} + \frac{8115}{3.25 \times 12.5} = 400 \text{ cusecs say}$$

Capacity of the Jamkhandi Branch:

Gross command 55700 acres

Irrigable cor and at 80% 44560 acres

Concentrati n in each season - 34%

Irrigated area $\frac{41560 \times 34}{100} = 15150$ acres

This will comprise of -

Khharif or Rabi seasonal 10100 acres

Two seasonal 5050 acres

$$Q = \frac{10100}{3.25 \times 25} + \frac{5050}{3.25 \times 12.5} = 250 \text{ cusecs say}$$

Note:- Capacities of other branch canals lying in the second section from mile 45 to 73 can be likewise be worked out. The capacities of above two branches are only worked here as they are in the first 44 miles canal now under construction.

The Chataprabha Left Bank Canal 0-44 miles with its North Branch and Jamkhandi branch, now under construction is being constructed for 1500 cusecs head discharge. We shall now consider how the storage at Hadalga can best be utilised, when the capacity of canal is not increased to 2000 cusecs(i.e. with 1500 cusecs only) which is not necessary if the second part of the canal from miles 45 to 73 is not constructed.

Pattern.....

Pattern of irrigation and type of crops are the same as suggested in Government Letter, P.W.D. No. 8151/36-I B(II), dated the 11th July 1949 mentioned hereinbefore. With 1500 cusecs at head, the area that can be irrigated is as worked out below:

$$AI/DC = 3.25$$

Area irrigated in a day

$$= 1500 \times 3.25 = 4875 \text{ acres.}$$

The 25 days rotation, the seasonal area that can be irrigated is -

$$4875 \times 25 = 1,21,875 \text{ acres}$$

Assuming 50% of this area is on two seasonal crops, the area that will be irrigated in both seasons on the whole canal is, say

Kharif seasonal 60,000 acres

Rabi seasonal 60,000 "

Two seasonal 30,000 "

Total area irrigated = 1,50,000 acres

The irrigable area in the 44 miles canal is 2,06,320 acres.

Concentration in each season -

$$= \frac{90,000}{2,06,320} = 44\% \text{ say}$$

Concentration on the Canal as a whole in both seasons is

$$= \frac{1,50,000}{2,06,320} = 73\%$$

Capacities of branch canals to achieve this concentration of irrigation

North Branch (Raybag) Canal -

Irrigable area 71600 acres

Irrigate area at 44% concentration in each season -

$$= 71600 \times \frac{44}{100} = 31504 \text{ acres}$$

This will comprise of -

Rabi or Kharif Seasonal 21,002 acres

Two seasonal crops 10,501 acres

$$Q = \frac{21002}{3.25 \times 25} + \frac{10501}{3.25 \times 12.5} = 517 \text{ cusecs}$$

or say 525

Jamkhandi Branch Canal

. Irrigable area 44560 acres

Irrigated area with 44% concentration in each season -

$$= 44560 \times \frac{44}{100} = 19606 \text{ acres}$$

This.

This will comprise of -

Rabi or Kharif seasonal 13070 acres

Two seasonal crop 6535 "

~~Two seasonal crops~~

$$Q = \frac{13070}{3.25 \times 25} + \frac{6535}{3.25 \times 12.5} = 321 \text{ cusecs}$$

or say 325

It is therefore necessary to design the sections of these branch canals with some what more free board to accommodate higher discharges as such a course will be advantageous to irrigate more area in the first 44 miles when the canal now being constructed is run purely as a Kharif canal or as an eight months' canal with the Hadalga storage and if the second part of canal miles 45 to 73 is not completed by then or its construction is postponed to a later date for any reason.

The lengths of the North Branch and the Jamkhandi Branch will remain as 18 miles and 13 miles as proposed in the sanctioned Project.

G.L.B. Canal miles 0-44 without storage

In the absence of a storage, the Canal will have to function only as a monsoon Canal. If only kharif seasonals are irrigated, the 1500 cusec canal will be irrigating at 25 days rotation.

$$1500 \times 3.25 \times 25 = 1,21,875$$

This would mean a concentration of -

$$\frac{1,21,875}{2,06,320} = 60\% \text{ nearly}$$

G.L.B. Canal, miles 0-73 with storage

It has been shown above that the canal head discharge would be 2000 cusecs and it will function for 8 months with the Hadalga storage of 32,500 M.cft.

It will further be assumed that only Kharif and Rabi Seasonals will be irrigated.

Area irrigated in each season

$$2000 \times 3.25 \times 25 = 1,62,500 \text{ acres}$$

In Kharif and Rabi seasons -

$$= 2 \times 1,62,500$$

$$= 3,25,000 \text{ acres.}$$

This will mean a concentration

$$\text{of } \frac{3,25,000}{3,56,640} = 90\% \text{ nearly}$$

This will show that if two seasonal are not permitted, 90% of the irrigable Command will be irrigated with seasonals only. So, we can have maximum area of irrigated food crops, thereby, irrigation will be spread over as large an area as possible.

Letter

No.5.M./Laddi

Karnatak Irrigation Circle,
Post Box No.28,
Dharwar, 13th Oct. 1953.

To

The Chief Engineer to Government,
(Irrigation) Public Works Dept.,
Bombay.

Subject:- Ghataprabha Left Bank Canal
Project -
Canal designs for the . .

Reference: Government Letter, P.W.D.
No.MIP-1151-J, dated the 16th May 1953. 18th

I enclose herewith a note containing a discussion on the suitable canal designs, discharge, length etc. if the Ghataprabha Left Bank Canal has to be worked as an eight months' canal with the Hadalga Storage as now contemplated and being projected.

2. The pattern of irrigation and type of crops as well as their water requirements are to be the same as suggested in Government letter P.W.D. No.8151/36-I.B(ii), dated 11th July 1949. A.I/D C assumed is 3.25 which is considered suitable looking to the nature of the tract, soils, lay out of areas etc.

3. From the discussion in the note, it will be evident that with 1500 cusecs at the head of canal, the storage of 32,500 M.cft. will not be fully utilised. Further, the main object of this project is to serve mainly as food crop scheme and what is more important also, is that benefits of irrigation should be extended to as large an area as possible since it is passing through famine area of Belgaum & Bijapur. It is, therefore, necessary to extend the canal upto mile 73 miles to serve the Bijapur area. It may be mentioned here that the project for the second part of the canal from miles 45 to 73 is also ready. This could be taken up for construction after the Hadalga Storage dam is constructed or along with its construction.

4. In the project for the first 44 miles, the designed discharges of the main and branch canals are -

Main Canal at head (44 miles)	1500 cusecs
North Branch at head (18 miles)	310 "
Jamkhandi at head (13 miles)	191 "

For the reasons stated in para 3 hereof, capacity of the main canal at the head and those of the above two branches will have to be as under -

Main Canal at head	2000 cusecs
North Branch	400 cusecs
Jamkkhandi Branch	250 cusecs

As discussed in the enclosed note, the main canal is now being constructed to carry 1500 cusecs, which can, however, be increased to 2000 cusecs later.....

later on by raising the bank when the second stage of the scheme is undertaken.

It may be mentioned here that the two branches are now being constructed to have increased capacities as mentioned in the note. Their lengths will, however, remain as proposed in the sanctioned Project.

5. This also disposes of the following Government references - (i) Government Letter P.W.D. No.8151/36-I.B(II), dated the 1st/10th March 1949 and (ii) Government letter P.W.D. No.8151/36-I.B(ii), dated the 11th July 1949. *P.S.S.* *P.43*

Accompts:-
1 note

hankar.
7 Superintending Engineer, K.I.C.

RNG.12.10.
compd.by:

re
12/10

P. W. D.
'J'

Among the various suggestions made in the Report of the Cabinet Sub-Committee on measures to improve the the financial position of Major Irrgn. Works in this State, it was suggested that instead of allowing any perennial irrigation from the proposed storage at Ajra the water might be used only for growing food-crops in Kharif and Rabi seasons, if necy. by making it compulsory for all land-owners whose lands come under the command of the canal to take water from it.

2. The S.E., K.I.C., ^{17443 and 5} was asked to offer his remarks on this proposal and also to state how this proposal would fit in with the Ghataprabha Left Bank Canal as proposed to be constructed. The object behind this was to know whether the Ghataprabha Left Bank Canal as designed-discharge, length, etc. - would be suitable or whether any modifications would be required if it has to be worked as an eight months' canal with Ajra Storage.

A detailed report has now been recd. from the S.E. and will be found at pp. 109-110 ^{ante}, which also gives the information called for in G.L. dated the ^{P. 101.102} 8-5-1953. It is presumed that no specific action is now called for on these pps.

Thro: D.E. (I).

D.S.

AG/20.10.

C.E. (I)

I think A is correct

Secy (for information)
24/11

M.P.

28/11

2
20.11.53
File
27/11